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MODERN METALS

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Missile Systems Division
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JUN 26 1959

MSD-P LIBRARY

ALCOA ON THE MOVE

President Frank Magee heads revamped management team as world's biggest aluminum producer boosts research, product development, promotion in bid for billion-dollar annual sales **(see page 30).**

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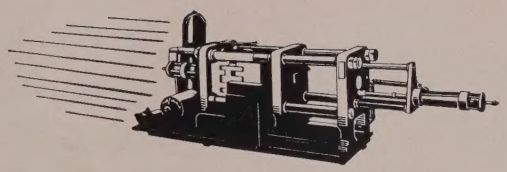
announcement



CAST-MASTER

H-P-M Division — Koehring Company

We are very happy to announce that Cast-Master, nationally known manufacturer of die casting machines and allied equipment, is now a part of Koehring Company and will operate as a division of the Hydraulic Press Manufacturing Company, Mount Gilead, Ohio. Designers and builders of precision die casting machinery since 1939, Cast-Master is one of the oldest exclusive manufacturers of this type of machinery in the country. The increased use of die cast parts in the automotive, appliance, electronic and many other industries forecasts a growth potential that will be strengthened by this union with the Koehring Organization.

The complete line of Cast-Master die casting machines will continue to be manufactured at the Bedford, Ohio plant. Operating Management at Cast-Master remains unchanged.

HPM

H939

THE HYDRAULIC PRESS MFG. COMPANY

A Division of Koehring Company • Mount Gilead, Ohio, U.S.A.

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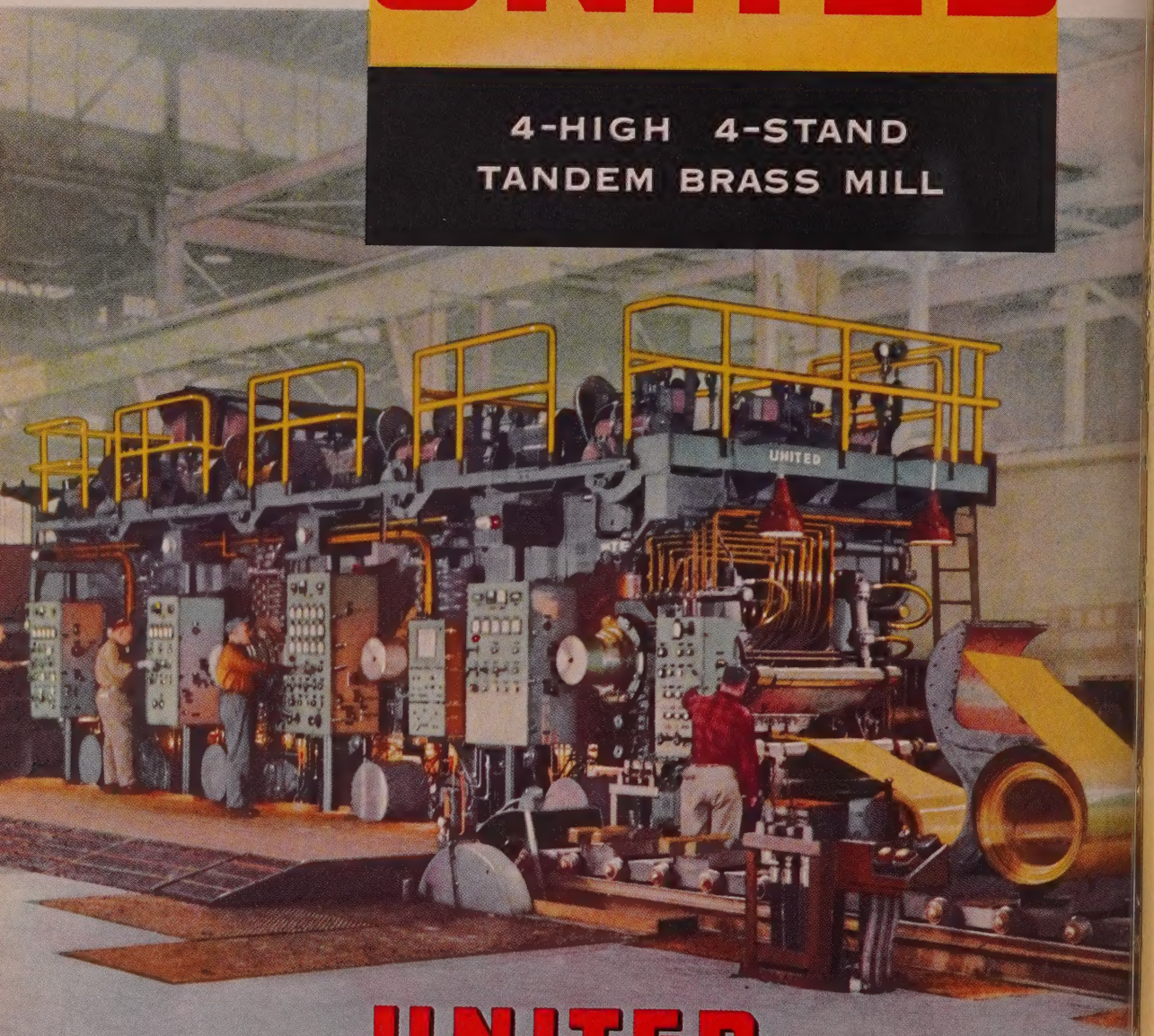

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Stedman Foundry and Machine Co., Inc., Aurora, Indiana

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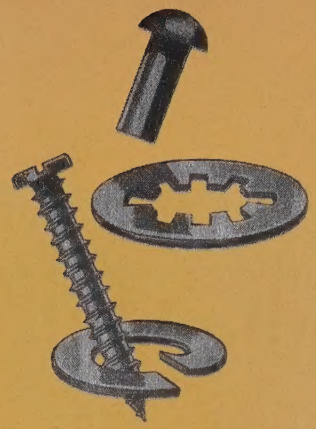

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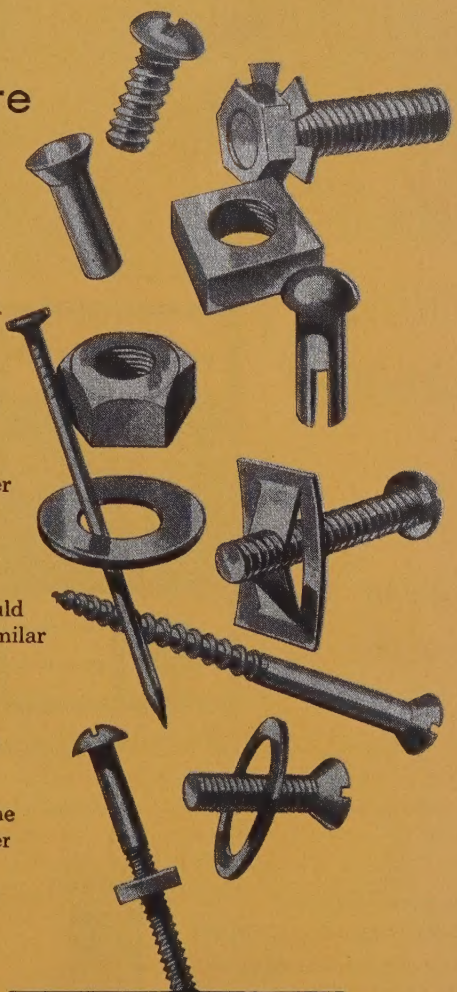
ALUMINUM FASTENERS

make your product last longer, worth more



Rust, stains, and weakened joints can destroy all the quality you put into a product—and this is exactly what can happen with conventional ferrous fasteners. Even coated ferrous fasteners can be damaged during assembly, and later cause damage by corroding.

But not with *aluminum* fasteners and components! They last the life of the product . . . and longer. Rust can't weaken the fastener because aluminum just can't rust—ever! Nor will aluminum fasteners create rust stain. Your products and components remain free of fastener trouble. And parts requiring maintenance are easy to disassemble and put together again—there's never any binding rust.

Of course, all aluminum parts and products should be fastened with aluminum. Fastenings of dissimilar metals can create corrosion and deterioration. Aluminum fasteners assure the good looks and quality of a product, don't weaken with age, and are low in cost. They can also be used with wood, plastic, textiles and plaster.

The next time you specify fasteners, consider the added quality of aluminum. If you have fastener problems or would like further information on aluminum in fastener applications, write to the *Reynolds Metals Company, Box 2346-NL-6, Richmond 18, Virginia.*

REYNOLDS DOES NOT MAKE ALUMINUM FASTENERS, BUT DOES SUPPLY THE FINEST QUALITY ALUMINUM TO THE FASTENER INDUSTRY... write today for the names of leading manufacturers

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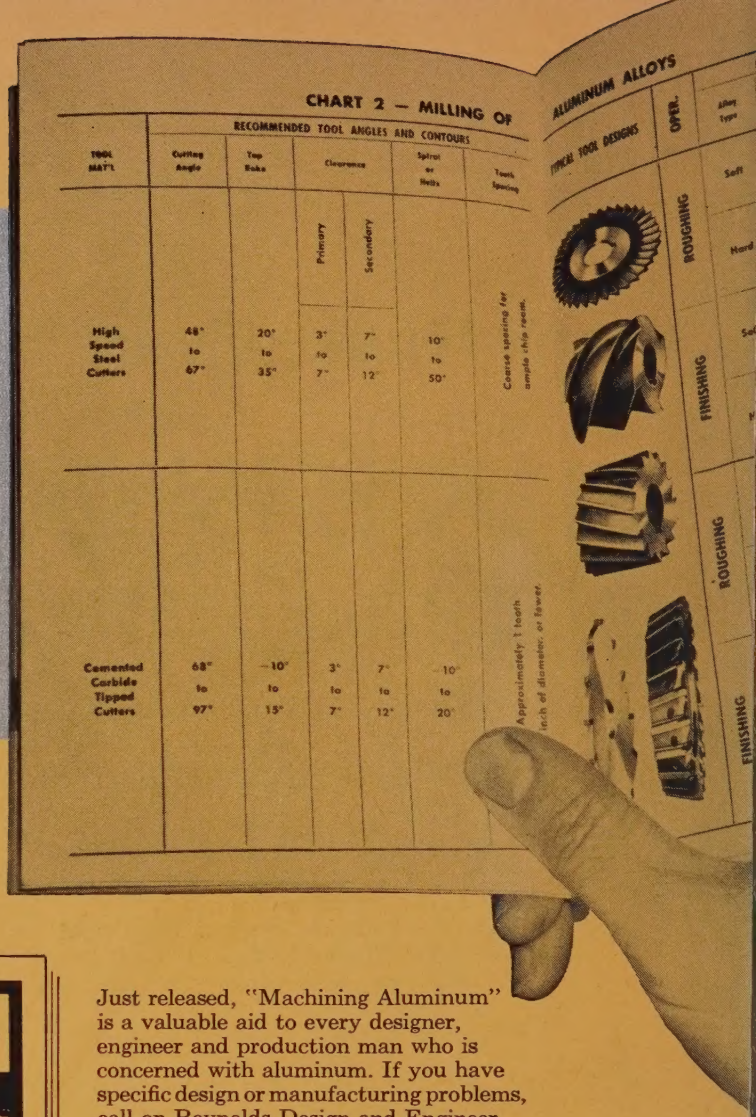

Just released, "Machining Aluminum" is a valuable aid to every designer, engineer and production man who is concerned with aluminum. If you have specific design or manufacturing problems, call on Reynolds Design and Engineer Services. In the meantime, make sure you get this valuable addition to your technical library. Subjects covered are:

- Turning Aluminum
- Drilling Aluminum
- Filing Aluminum
- Milling Aluminum
- Reaming Aluminum
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- Shaping and Planing
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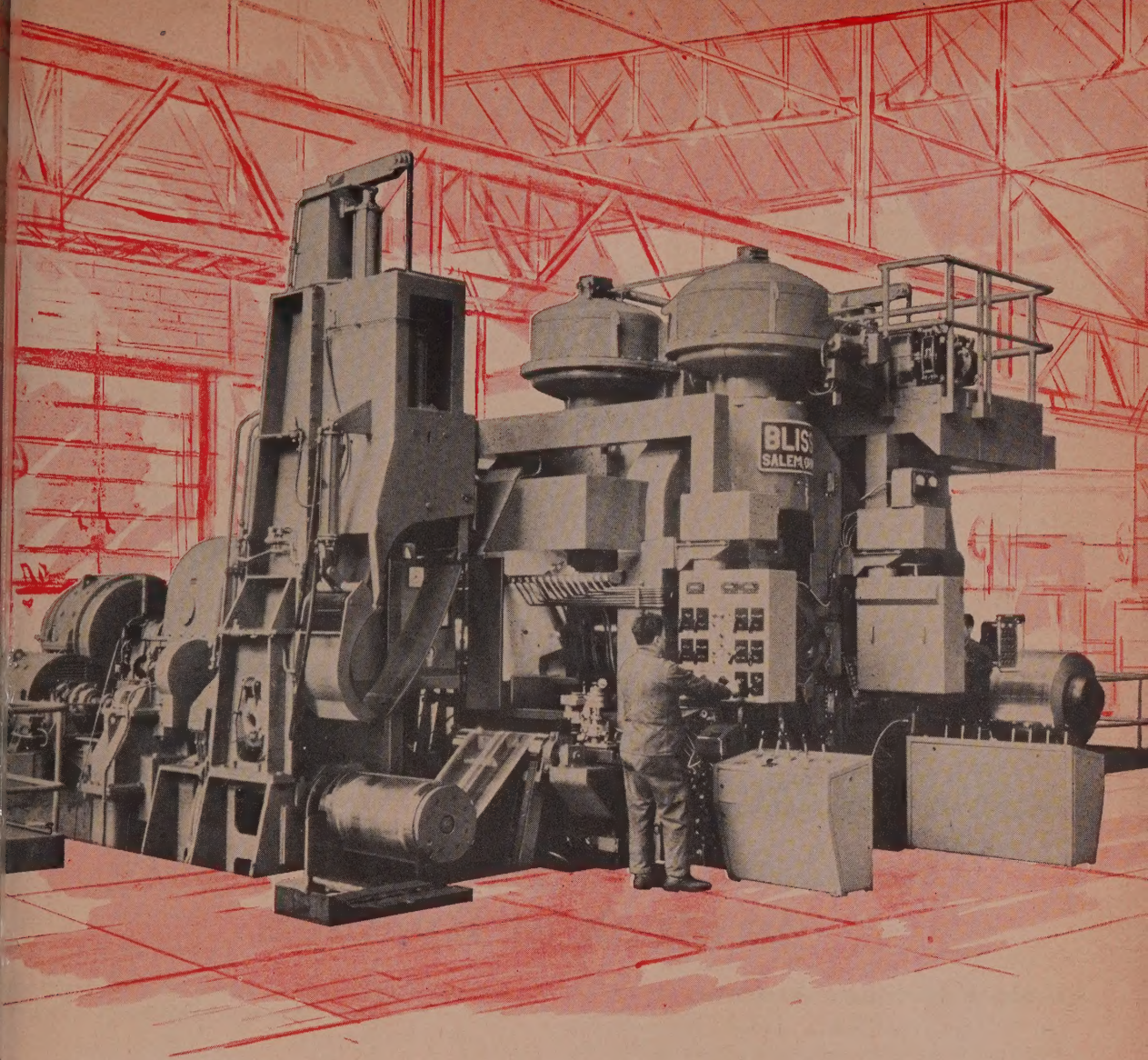

New Bliss reversing cold mill for France's largest producer of brass strip

Near Paris, Compagnie Française des Métaux, France's largest producer of brass strip, rolls brass on its new Bliss 6½" & 30" x 36" four-high reversing cold mill.

The mill, which can attain a speed of 1,000 fpm is equipped with the auxiliaries necessary to produce brass strip of the highest quality, in widths up to 30" and thicknesses as fine as .0028".

The brass thus produced is used throughout French industry... for automobiles... for defense... for hard goods... for jewelry... for the myriad needs of free Europe.

The Paris installation of Compagnie Française des Métaux is the latest of many such Bliss mills being operated throughout the world, rolling all kinds of ferrous and non-ferrous material. To learn of other Bliss-engineered installations, write for a copy of our 84-page Rolling Mill Brochure, Catalog 40-B.

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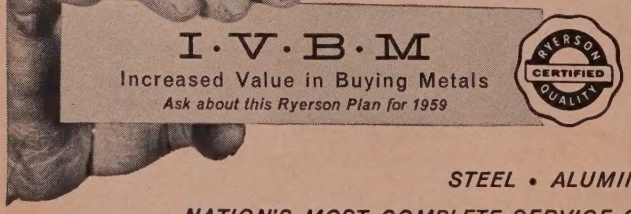

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Modern Metals

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NEWS, PRODUCTS & PEOPLE 70

LOOKING AHEAD 98

ALCOA, 1960: A BILLION DOLLAR BABY ..... W. B. Griffin

THE EARNINGS PICTURE — Many factors combined to depress Alcoa's earnings in 1958 and the first quarter of '59, but the worst of the profit-killing pressures are easing, and Alcoa may well reach billion-dollar sales in '60 ..... **30**

EQUIPMENT AND PRODUCTIVITY — To keep a step ahead of inflation, Alcoa is investing heavily in more efficient equipment to raise output per manhour **32**

POWER: THE CHANGING EMPHASIS — Alcoa's pioneering with new power sources has brought fundamental change from hydroelectric power before the war to gas, lignite and coal today. Nuclear power may be next **34**

RESEARCH AND DEVELOPMENT — The metal industry's most extensive and productive R & D program began at Alcoa over 40 years ago; has evolved into a tight-knit, well coordinated effort costing $18 million this year **34**

ALCOA RESEARCH LABORATORIES — Its 16 divisions employing 800 scientists and technicians are pursuing more than 400 projects. Outstanding accomplishments range from new alumina and smelting techniques to improved alloys, new processing methods, superior finishes. Research activities will be centralized in a huge new $30 million research center to be built near Pittsburgh **38**

ACCENT ON DESIGN — Famous "Forecast" collection highlights efforts to fully exploit aluminum's rich design potential; typifies Alcoa's non-competitive approach **46**

THE FOREIGN PICTURE — Low per-capita aluminum use and low labor costs abroad spur U. S. producers' interest in foreign operations. Alcoa is pushing projects in Japan, South America, Venezuela; has set up foreign sales group to capture bigger share of overseas sales **50**

HOT ON ADVERTISING — Huge budget nourishes ad campaigns in all major media. Emphasis is on customer support through "Market Maker" and "Forecast" programs **54**

SALES: NEW MANAGER APPROACH — Switch to industry manager setup smooths liaison between sales and operations; aids in establishing growth market sales goals **58**

WHAT'S AHEAD — Aim is to boost earnings to $150 million after taxes. Efforts intensified to exploit big growth markets including electrical, automotive, packaging, building industries, highway products, others **62**

THE BOSS: FRANK MAGEE — Biggest aluminum producer's chief executive officer started as salesman 42 years ago; is still sales-minded; typifies new Alcoa personality **66**

MODERN METALS

Read in companies that produce, fabricate and cast aluminum, magnesium and titanium, and firms that use these metals in manufacturing end products.

THE COVER: Aluminum sales are ming today, and industry output is ng pushed to near-capacity. But still e capacity is under construction, and hale of a sales and promotion job rens to be done. To see what the indus- leader is doing, we recently spent a k talking to Alcoa's top management n — including President Frank Magee, wn on the cover — and came away con- ed that their research, product devel- ment, promotion and sales activities mise a bigger and better future not for Alcoa, but for the entire indus- as well. The story of what we found ts on page 30.

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Modern Metals has by far the world's largest culation among light metals fabricators, ndries and product manufacturers who use minum, magnesium, and titanium. Circulation: w over 14,000 copies per month. Acceptance der controlled circulation at Barrington, Ill.

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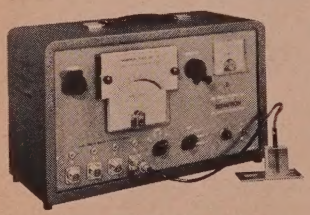

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Letters

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The total area of our factory is over 77,000 sq. ft., with an anodizing plant, and a complete department where we make our own dies and jigs.

Being pioneers in the Cuban market, our jobs are considered the best in the building business, with more than 100 employees.

We are thinking of adding a progressive line of products not related with building because this type of business has almost stopped. The government is planning new industries and is eager to help economically.

Perhaps MODERN METALS can give us some ideas as to what products we should manufacture.

"J"—Cuba

MM—This firm is Panam Products, Havana, Cuba, headed by Jose Maseda. If any aluminum product manufacturers have products that could be manufactured in Cuba on a license basis, we suggest they contact Mr. Maseda direct.

Products that could be sold in Cuba might include outdoor furniture, fencing, small appliances, containers, cans, lighting fixtures, ladders, materials handling equipment, signs, rails, nameplates, frames, etc.

MOBILE HOMES

Sirs:

We have noticed your recent articles on the consumption of aluminum by mobile home manufacturers. Can you tell us where we might obtain a geographical list of manufacturers of mobile homes?

"H"—Missouri

MM—According to our last count, the industry consisted of well over 200 manufacturers—most of them small, and spread throughout the country. For a complete survey-article on the subject of mobile homes, see Modern Metals, September 1957.

We understand that you can get a list of these manufacturers from Mobile Home Manufacturers Association, 20 North Wacker Drive, Chicago 6.

THE CASTING INDUSTRY

Sirs:

Your coverage of the aluminum casting industry in the May issue was very thorough.

. . . One thing that puzzles me on your front cover chart is that you don't mention what types of castings are used in the totals. . . .

"S"—Michigan

MM—The masthead page description points out that the cover chart includes "all types" of castings. Perhaps we should have stated that the totals included sand, permanent mold and die castings. Sand castings account for about 18% of the total; permanent mold, 28%; while roughly 50% is accounted for by die castings, which are gaining the fastest as auto firms switch to more aluminum.

By the way, it looks as though the alu-

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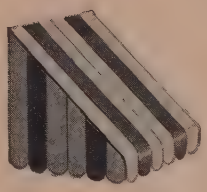

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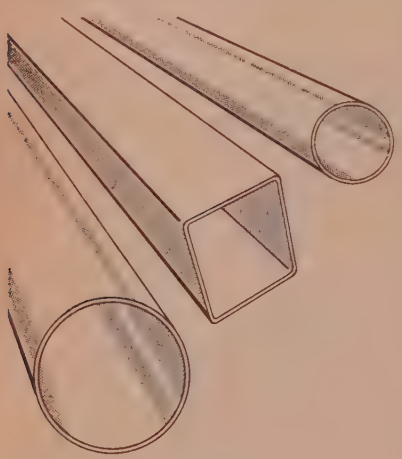

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minum casting industry is headed for record-breaking sales this quarter.

WANTS SHINGLES

Sirs:

Will you please advise us as to the names of companies who are manufacturing aluminum roofing shingles?

We are interested in distributing this item and wish to contact manufacturers.

"R"—Pennsylvania

MM—We have sent you the names and addresses of two aluminum shingle manufacturers. We'll be glad to forward names of other shingle makers to "R".

ALUMINUM-PLASTIC PANELS

Sirs:

We noted with interest your article "Aluminum + Foamed Plastic" appearing in your February 1959 issue. This article concerns Alcoa's new product, Alply.

It would be much appreciated if you could furnish us with an address where we may receive further information on the above mentioned product.

"R"—New York

MM—This article concerns a versatile aluminum-foamed plastic sandwich panel with a very high strength-weight ratio, good insulation value, and moisture resistance. It should have great appeal for building panels, appliances, trailers, etc. The manufacturer is Aluminum Co. of America, Alcoa Building, Pittsburgh 19, Pa. For some details on this company, see the story in this issue, starting on page 30.

SEEKS FAST FLUIDITY TEST

Sirs:

We would appreciate your advising whether or not there is a portable testing unit to test the fluidity of aluminum alloys. At present, we are using secondary alloy, #679, and find considerable difference between shipments of this material. We are purchasing our material from the most reliable sources, and receive a notarized analysis of each shipment. However, in some lots received we have a great deal of cold runs.

If there is a quick way to test each shipment, we would like to have full information.

"G"—Missouri

MM—We most certainly believe there has been equipment developed to test the fluidity of molten aluminum before casting, but do not know of any source for same. If any reader can enlighten us, we'll be glad to pass it along to "G".

HOW TO ANODIZE AUTO PARTS

Sirs:

Your article on how Eaton anodizes aluminum auto parts (MM, May '59) was very interesting. It certainly shows the inroads being made by aluminum in the transportation field.

If you have a spare reprint or tear sheets, I'd certainly like to obtain an extra copy.

"P"—Michigan

MM—Reprints have been made. We've sent you one.

BARONI BRIDGE

Sirs:

We would like to have another copy of the January 1959 issue of Modern Metals, or if you are unable to do that, we are interested in the article pertaining to the Baroni Bridge . . .

"H"—Missouri

MM—We have sent you tear sheets of the article on the Baroni Bridge, as well as a letter which somewhat up-dates the progress on this development.

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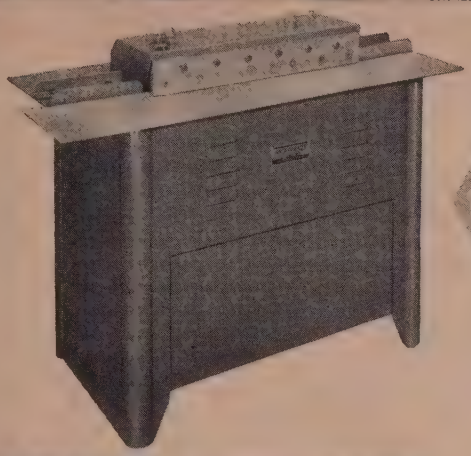

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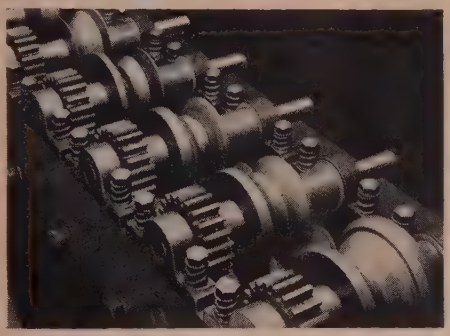
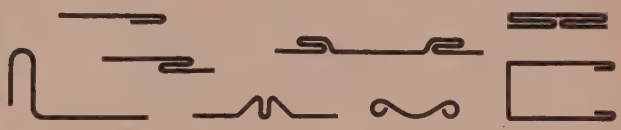


2 CUSTOM ROLLS TO YOUR SPECIFICATIONS



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Here and There

Foil's Flying High » » Don't look now, but the aluminum foil business is well on the way to record shipments in 1959. Nearly 57 million pounds of the thin stuff was shipped in the first three months of this year—a fat 20% gain over last year's first quarter total, and even 12.6% better than first quarter shipments in the record-bustin' year of '57. What's more, the annual rate based on this year's first quarter shipments is more than double the 113,397,000 pounds shipped in 1953. Foil did surprisingly well last year—which was a bad one for the aluminum industry, generally. Consumption totaled 214.8 million pounds—a decline of less than 1% below '57s all time high of 216.9 million pounds. Seems that increased use in semi-rigid containers almost made up for lower consumption in locker plants, freezers, restaurants and households, and an even steeper decline in the use of foil in building applications. Foil's startling gains in the past five or six years lends credence to predictions that use of aluminum in packaging will double in the next half-decade.

Distributors Doing Fine » » Notwithstanding the growing competition of the independent extruders and rerollers, the aluminum distributors have boosted their sales to more than 16% of total primary mill production, according to the NAAD. These days, aluminum is second only to steel in warehouse sales volume. The Association was right on target when it forecast a 14% sales gain for the first half of 1959 compared with the same period last year. The small order is no longer the distributor's main business. Orders of 2000 pounds or more made up over half the total tonnage shipped by warehouses, while orders of 300 pounds or less came to 10-13%. Sheet, of course, is the sales leader, with an 11% gain in the first quarter of '59 over the last period of '58. Rod and bar shipments were up 10%, while tubing held to around its 1958 level. Bearing out the warning of Fullerton Steel's Gordon Anderson (see MM, Jan., '59) extrusion sales declined about 11%. Chief reason: Independent extruders can sell shapes from 2½ to 6 cents under the primary producers' carload base price. But despite product, geographical and seasonal variations—and the impact of imported metal on eastern warehouses (the St. Lawrence Seaway will doubtless extend this effect to the midwest), the aluminum distributor is a growing factor in the aluminum industry.

Winning Way With Windows » » To the surprise of practically nobody, a survey by the Business & Defense Services Administration has revealed that aluminum has all but preempted the metal prime window business in the past ten years or so. Back in 1947, steel accounted for better than 87% of the industry's volume while aluminum had a measly 12.6%. Ten years later, aluminum's share had zoomed to 63.5%, while steel slipped to 36.5%. In the same period, the dollar volume of the metal window business had bet-

CAN YOU MAKE THIS BEND IN YOUR ALUMINUM TUBING!

LUSTRATED ARE two typical parts made from two fferent aluminum alloys. Each tube is submitted to a arp bend. The first photo is 6061-T6—an excellent alloy t misapplied in this application. Note the compression rinkles on the smaller radius and fracture on the pe- ohery. Now compare this with photo number 2 which ry graphically illustrates the unusual bending qualities the new Reynolds 5052 aluminum tubing—now car- d in stock by Perry Kilsby!

sing the right *aluminum alloy* for specific applications often the difference between success and failure. Using e *right tubing*—drawn or Holobar, rather than solid bar ock—can make a vast difference in cost. Perry Kilsby n give you metallurgical help plus knowledge gained ly from practical experience to help you solve your uminum fabricating problems. Call us today!

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RAWN TUBES—Available in diameters from ⅛" to 5¼"; all thicknesses from .020" to .375". Drawn tubing usu- y has a finer grain structure than extruded tubing due cold working in the drawing dies. Tolerances are also ld closer, both in wall thickness and diameter. Drawn bing is preferable where thin wall tubing of small and ominal diameters is required. A primary use is in fluid nsferring operations.

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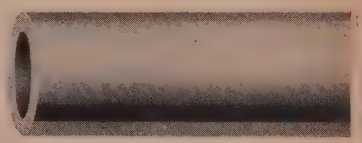

QUICK COMPARISON OF ALUMINUM ALLOY CHARACTERISTICS

3003	Inexpensive alloy, excellent ductility for low strength requirements.
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6061	Comparatively inexpensive, reasonably strong, ductile and weldable. The "work-horse" for all around versatility and utility.
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ter than doubled from around $90 million in 1947 to over $206 million in '57. The BDSA survey was based on reports from 95 of the estimated 195 metal window plants. Of the reporting plants, nine used steel exclusively, 67 used only aluminum, and 19 used both metals in '57. Altogether, they consumed 95,000 tons of steel to produce 3,454,000 windows worth $59.8 million, and 68,000 tons of aluminum in slightly over 6 million windows worth $146.4 million. Although residential windows accounted for 75% of the aluminum total, they represented less than half ($72 million) of the total valuation. On the basis of the BDSA figures, the price of steel windows averages out at $17.31 per unit, while the average for aluminum comes to $24.39 per unit. Thus, aluminum is replacing steel in a large market, even though the product costs roughly 40% more in the light metal.

Housing Heyday Here? » » Home builders in 43 U. S. cities are sparking a mammoth "House of Ease" drive this month, according to A. H. Williams, vice president of Reynolds Aluminum Sales Co. He indicated that the program which began in January, 1958, will eventually put the "House of Ease" into the 160 major cities which account for 80% of new home construction; that as many as 15,000 aluminum-clad homes will be built during 1959, including some 3000 H-of-E projects which feature the package of from 20 to 33 Reynolds-fabricated building products. Added impetus has been given the use of aluminum in home building through contracts between Reynolds and Lu-Re-Co Service Association, enabling more than 1400 lumber dealers to supply a complete line of aluminum "House of Ease" products to home builders for the first time. Add to this the achievement of National Homes Corp. in boosting its aluminum models to 50% of its total production this year, and it becomes apparent that aluminum's future is assured in the home building field. In the field of architecture and construction, 470,000 tons of aluminum were used last year, more than 25% of all the aluminum sold commercially. Of this amount, 150,000 tons went into home improvement applications. New home construction took about 65,000 tons last year, and is expected to consume about 100,000 tons this year.

Need More Like Him » » Once upon a time, there was a golf addict who one day surveyed his old, beaten-up, made-to-order aluminum putter and decided it was time to replace it. When he asked the pro at the golf club to duplicate it he was told that he made forged steel irons — nothing else. Our hero was so disappointed that the pro dug up the name of a metalworking firm who could make the aluminum head, whereupon the golfer approached this firm with his problem. The metalworking outfit said they'd be glad to do the job, but a rather costly die was involved and the minimum order would be 1000 — at $5 apiece. Well sir, they got the order. In time the heads were delivered to the golf pro at Merion Golf & Country Club, Philadelphia, and this golf-playing tycoon calmly wrote a check for $5000. The pro has 900-odd aluminum putter heads stacked up waiting for takers. You duffers had better act fast — they're going like hotcakes.

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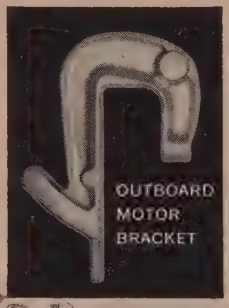

Investigate the use of Harvey Aluminum Forgings for critical metal parts. Forgings offer durability, maximum resistance to shock, high strength, excellent surface finish, and other properties unobtainable in cast form. And in aluminum, you benefit from a high strength-to-weight ratio, attractive appearance, maintenance freedom, easy machinability, broad design flexibility, plus other inherent advantages.

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Useful Data

"Cleaning and Preparing Metal In Aircraft Production" is a metal-by-metal study including aluminum and magnesium published by Oakite Products, Inc. Five-step process for preparing aluminum for resistance welding is outlined. Detergents for aluminum are discussed as well as conversion coating, paint stripping, barrel finishing and forming aluminum with Oakite soluble lubricants. A shorter but similar treatment is given magnesium. Write to E. Carlson, Oakite Products, Inc., 45B Rector St., New York 6.

Aluminum Catalog of Wolverine Tube, increased to 31 pages in its new edition, contains information regarding drawn aluminum tube and extruded tube and shapes. Included are special features of the metal; metallurgical aspects; mechanical, physical and chemical characteristics; tolerance standards and extrusion definitions, along with a statement of scope covering available alloys, length and shipping limitations and range of sizes. Much of the information is in tabular form for quick reference. Address inquiries to H. A. Harty, Wolverine Tube, Division of Calumet & Hecla, Inc., 17200 Southfield Rd., Allen Park, Mich.

The Titanium anodizing spline is described in an 8-page booklet put out by its manufacturer, LeVita Industries, Inc. The spline can be used for hand or automated operation, weighs less than ½-lb. per foot, and is adaptable to any kind of part. Aluminum core gives top conductivity. Splines come in standard and custom-made lengths. They are ¾-in. in diameter. All parts exposed to the solution are made of pure titanium. The booklet pictures spline and rack accessories. For copies address F. O. LeVita, LeVita Industries, Inc., 2229 E. Jefferson Ave., Detroit 7, Mich.

"Are You In This Profit Picture?" an illustrated booklet put out by Picker X-Ray Corp., considers the advantages and disadvantages of both x-radiation and gamma radiation for inspection and product testing. Included are examples of applications of x-ray and radioisotope machines in foundries, factories, airframe construction and maintenance, shipbuilding and other industries. Effects of radiation on product quality and production costs are considered. Charts show the physical, chemical and biological effects of various dosages of radiation. Address inquiries to J. W. Leask, Picker X-Ray Corp., 25 S. Broadway, White Plains, N.Y.

The Packaging Manual for Aluminum Sheets has been issued in a revised edition by the National Association of Aluminum Distributors. The Manual is divided into three sections: General information; materials (lumber specifications, staples, steel bands, pressure-sensitive tape and corrugated cardboard); and package assemblage for city and out-of-town delivery. A series of photographs of a novel mobile packaging

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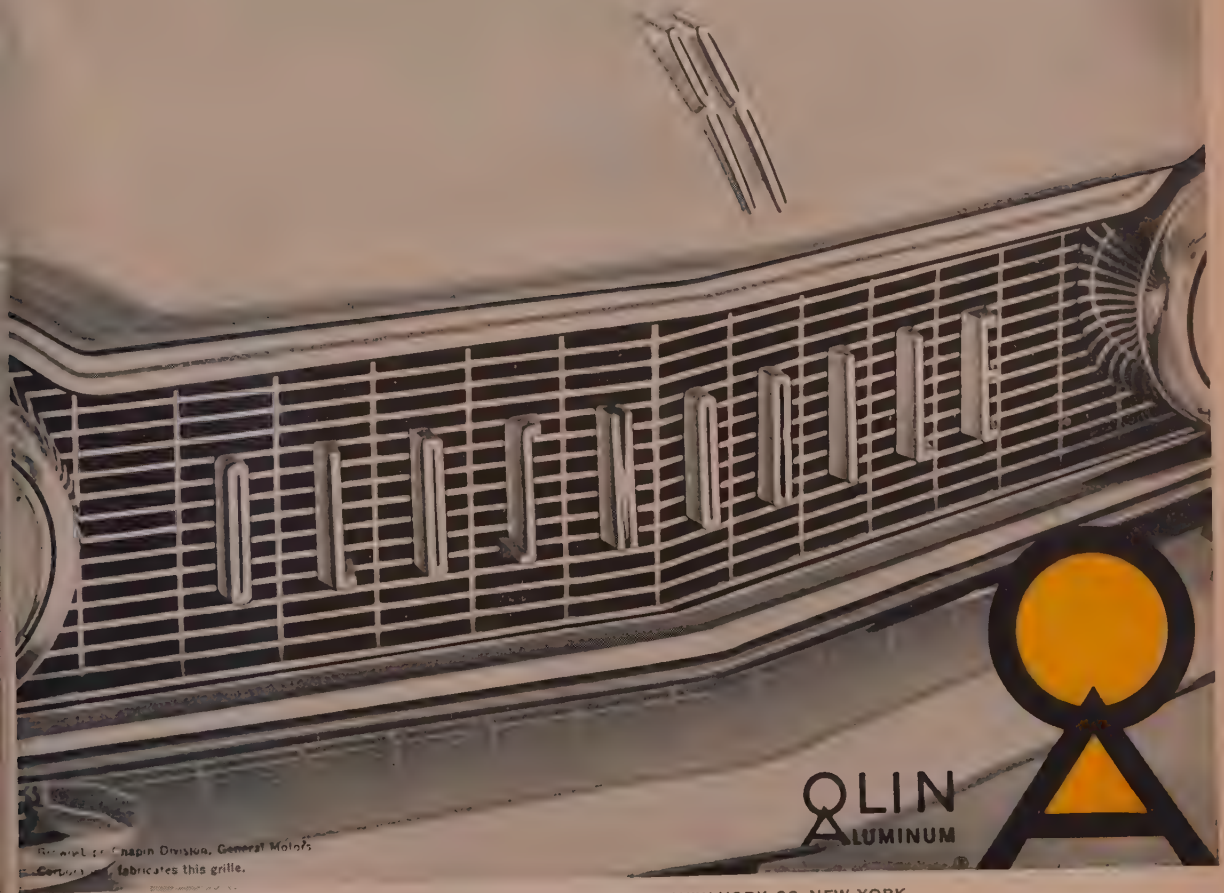

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cart is included. A set of two manuals may be ob tained by the general public from R. Bruce Wal National Association of Aluminum Distributors, 190 Arch St., Philadelphia 3, Pa.; price $200. A set of 1 drawings of the cart is priced at $50. Additional copie of the manual are $10 each, while additional drawing may be purchased at $30.00 per set.

Cold Roll-Forming, an 88-page presentation issue by The Yoder Co., is "an illustrated story of the equip ment and process of cold roll-forming; end uses o its products, their advantages and commercial poss bilities; also auxiliary equipment for curving, coilin ring-forming, notching, perforating, welding, embos ing, automatic cut-off and other operations frequentl incorporated in cold-forming production lines." Writ to R. L. Burt, The Yoder Co., 5500 Walworth Ave Cleveland 2, Ohio.

An acid deoxidizer for aluminum, Oakite Compoun No. 34, is the subject of a folder issued by the manu facturer. Preparation of the deoxidizing bath is de scribed along with six applications for Oakite Com pound No. 34 in the fabrication and finishing of alu minum. E. Carlson at Oakite Products, Inc. 50A Recto St., New York 6, will furnish copies of the folder.

"Magnesium Alloys Improve Aircraft Performance" describes the physical and mechanical properties o magnesium castings, sheet and extrusions that are ad vantageous in airframe design and gives numerous cas histories of magnesium applications in aircraft, missile and helicopters. The 26-page brochure will be sen upon request to C. L. Dickey, Dow Chemical Co., Mid land, Mich.

Modern Practices in Porcelain Enameling was th theme of the 1958 Shop Practice Forum of the Porc lain Enamel Institute, and proceedings have been pub lished in Volume 20 by the Institute. Included ar papers and transcriptions of discussions on base meta for porcelain enameling, metal preparation, tests an specifications, architectural porcelain enamel, and co factors in shop operations. A paper on Growth o Aluminum During Porcelain Enameling is include under the architectural porcelain enamel symposiun Address requests to J. C. Hill, Porcelain Enamel In stitute, Inc., 1145 Nineteenth St., N.W., Washingto 6, D.C.

Cincinnati Shears are illustrated by The Cincinna Shaper Co. in a 47-page booklet. Sections describe ap plications and features of Cincinnati shears, giv specifications and dimensions. Copies can be obtaine from Lawrence Von Moll, The Cincinnati Shaper Co Cincinnati 11, O.

Magnesium and Titanium Data, largely in cha form, is published in a 40-page folder of that nam by Brooks & Perkins Inc. It contains a multiplicity o quick reference information on properties, specific tions and design of magnesium and titanium as we as data comparing these to other metals. Another pub lication, the "Magazine of Magnesium," is put ou quarterly by the company for designers and engineer

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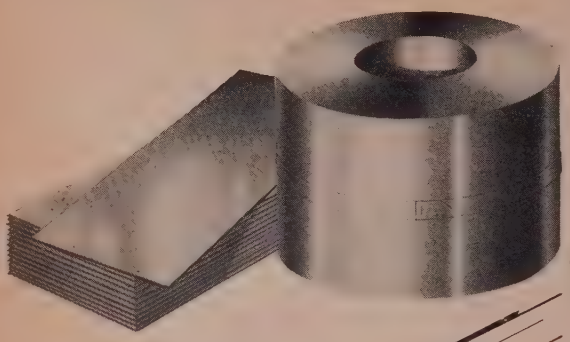

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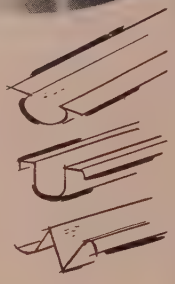

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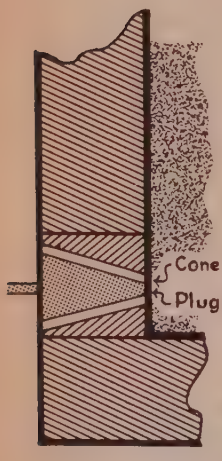

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Established April, 1925

Write to Ralph Gillespie, Brooks & Perkins Inc., 1950 W. Fort St., Detroit 16, Mich.

Power Press Brakes and Press Type Brakes are described in one of the Cyril Bath Co.'s catalogs on its various metal forming machines. Special features and specifications of both types of machines are listed. The Cyril Bath Co., 32440 Aurora Rd., Solon, Ohio, will answer requests for the folder.

The forging of intricate giant aircraft components on the world's largest closed-die forge presses is shown in "Hands of the Giants." a 16 mm sound-color film released by Wyman-Gordon Co. Shot at the company's North Grafton plant, the 30-minute film depicts the manufacture of forgings from billets of titanium, magnesium, steel and aluminum. It is available without charge from P. R. Johnson, Wyman-Gordon Co., Worcester 1, Mass., for showing to industrial groups.

"This is PMD" names Permanent Mold Die Co.'s 14-page brochure on their die casting dies, automated molding machines, permanent mold dies and piston cores for non-ferrous metals. PMD's own plant equipment to handle die and mold problems is listed. Table of draft angles and .007 inch per inch shrinkage allowance table are included. Write to Howard Wright, Permanent Mold Die Co., Inc., 2275 East Nine Mile Rd., Hazel Park, Mich.

Instantaneous Heat is the title of a 48-page bulletin, put out by The A. F. Holden Co. to describe the firm's luminous wall combustion system for gas-fired, infrared heat treating furnaces. The booklet sets forth the research story behind the luminous wall development, what it is, how it works, and its present and future applications. A glossary of terms is included as well as numerous drawings and prints about the system for the metallurgist and heat treating engineer. Obtain copies of Technical Bulletin No. 209 from J. B. Carey, The A. F. Holden Co., 14341 Schaefer Highway, Detroit 27, Mich.

Ultrasonic cleaning solutions for industry are the subject of Bulletin BB-100 issued by Acoustica Associates, Inc. The folder lists typical operations performed ultrasonically including cleaning, degassing, degreasing, heat quenching and pickling. Acoustica Standard's ultrasonic equipment is shown in photographs. Typical immersible transducer arrangements in stock or custom fabricated tanks are shown in drawings. Charts give specifications of generators and transducers of various models. The folder may be obtained from Kurt Vogt, Acoustica Associates, Inc., 26 Windsor Ave., Mineola, L.I., N.Y.

A zirconium plant for the production of 1.5 million pounds of the atomic age metal per year designed, engineered and constructed by the Badger Mfg. Co. for Columbia-National Corp. illustrates the activities of Badger. The plant was engineered and constructed without going through pilot plant stages. Brochure on the plant includes flow chart and photographs. A copy is available from Badger Mfg. Co., 230 Brent St., Cambridge, Mass.

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The above pictorially represents the growth of the finished part which, as produced, is approximately 16 in. long: a missile hydraulic component made by Alcoa for Vickers, Incorporated. It represents savings

Estimate for yourself what it would cost to produce such a form by laborious machining from bar stock—the only practical alternative. Include all the labor of rough-cutting, precision machining and final finishing—*and* the costly waste of metal.

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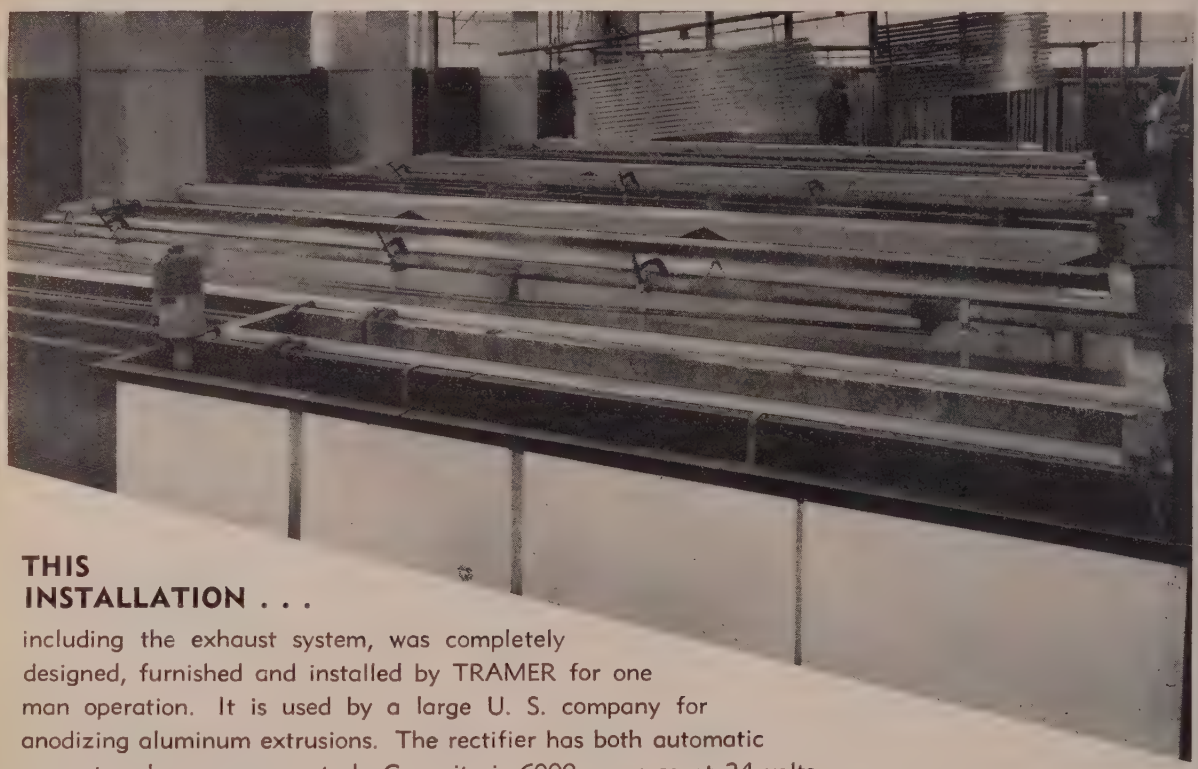

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including the exhaust system, was completely designed, furnished and installed by TRAMER for one man operation. It is used by a large U. S. company for anodizing aluminum extrusions. The rectifier has both automatic current and amperage control. Capacity is 6000 amperes at 24 volts. The tanks are 27 feet long.

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New Enterprise

A **sun-proof facade** was formed by aluminum louvres nounted on a framework of aluminum tubing to pro- ect employees in the World Savings & Loan Associa- ion Building from the scorching, year-round rays of he Lynwood, Calif. sun. Aluminum Skylight and Spe- ialty Corp., 3545 Greenwood, Los Angeles, Calif., rected the louvre system at a total cost of $16,000.

Olin Aluminum, 400 Park Ave., New York 22, is ffering **25-pound ingot** at the same price per pound s 30-pound ingot. F. J. Daniels, manager of aluminum ig, ingot and billet sales, Metals Div., Olin Mathieson hemical Corp. said, "Its increased surface area im- roves the melting, and lighter weight facilitates han- lling and charging into furnaces."

Edes Mfg. Co., Plymouth, Mass., manufacturer of hotoengraving metals, is now a subsidiary of Revere opper and Brass, Inc. John Farrell continues as vice resident and general manager of Edes, under direct upervision of James B. Buckley, vice president in harge of Revere's New Bedford, Mass. Division. mong its other products Edes lists **photoengravers' agnesium** called Magnemetal.

Aluminum clad high-tensile aluminum alloy wire rovides protection and increased wearability as in- orporated in a swimming pool vacuum **hose** made by uctall Corp., 1751 Placentia Ave., Costa Mesa, Calif. nner wall is comprised of seven plies of "Duthene" eneath a vinyl cover.

Anodizing facilities have been added to May, Inc., luminum firm located at 5803 Alies Rd., Houston, ex. "Finishes including a bright mirror-like surface, pearly finish, and a satin-like surface are now fur- ished," D. M. May, president of the firm, said.

Textron Metals Co., Girard, Ohio, is building a lant in Pottsville, Pa., for the manufacture of **alumi- um prime windows,** storm doors and storm windows. . C. Montgomery, president of Textron said the one- tory structure will cover 115,000 sq. ft.

Safety Grip-Strut **stair treads** for anti-skid protection n industrial plants, are made of aluminum by Products ivision, The Globe Co., 4010 S. Princeton Ave., Chi- ago 9. They are easily cleaned by hose because over 5% of total area is open.

Spun aluminum housing and translucent fibrous lass shade are combined by Pittsburgh Reflector Co., 10 Oliver Bldg., Pittsburgh 22, Pa., into an attractive one-shaped **lighting fixture.** Semi-recessed and surface odels are made.

Reynolds Metals Co. has named Winter Seal Corp., 4595 Meyers Rd., Detroit, Mich. as **exclusive distrib-**

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utor of its "Lifetime" colored aluminum roof shingles in the Michigan and Toledo areas.

Talon, Inc., of New York (zippers) has acquired the assets of Paramount Die Casting Co., producer of **custom die castings** of aluminum, magnesium and zinc as "part of a program to diversify its product lines." Paramount plants are St. Joseph, Mich., and Seymour, Ind. No purchase price was given.

The "Door-Seal" **door stop** is made of aluminum with weather-tight vinyl insert by Adams Engineering Co., Ojus, Fla.

Aluma-Slide **sliding door track sets** can be easily installed and do not require the use of hangers, rollers or sheaves, according to the manufacturer, Macklanburg-Duncan Co., Box 1197, Oklahoma City 1, Okla. Aluma-Slide comes in packaged sets for 1/8 in., to 3/4 in. sliding panels of pegboard, masonite, glass or plywood.

Pfister Aluminum Corp., Allendale, N. J., has purchased a former textile **mill** at North Adams, Mass. Pfister produces aluminum tubing, extrusions, coils and rolled shapes.

L & M Co., 4515 Oates Road, Houston, Texas, produces aluminum castings for **aluminum signs** which it makes. Dura-Glaze, a fused ceramic coating, is applied to the signs and the company reports that it provides excellent resistance to corrosive atmospheres and salt water. Metal is cleaned, deoxidized and the surface activated to make it receptive to a special DuPont dichromatic dip and Dura-Glaze coats.

Duck boats are made of aluminum by The Milco Tank & Boat Co., White Pigeon, Mich., for hunters or anglers.

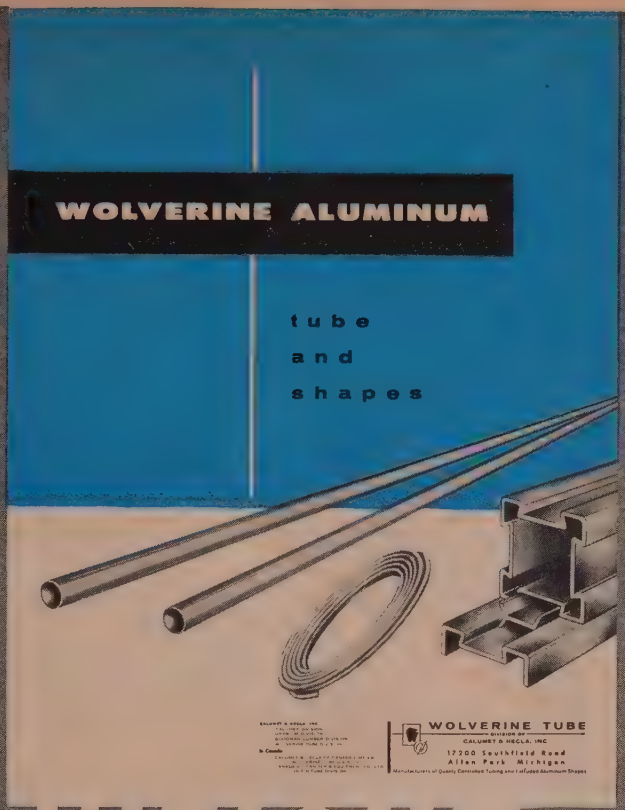
Aluminum **magnet wire** is being produced at Kaiser Aluminum's Newark, Ohio plant. Insulation is applied by the Wire and Cable Div. of the Electric Auto-Lite Co., Port Huron, Mich., and Hazelton, Pa. Special aluminum processing permits the guarantee of 62.7% IACS conductivity.

Unit Extrusion Co., Detroit, Mich., warehouses and distributes **aluminum extrusions** for the building industry. President of the new firm is Fred Campbell. It occupies a 45,000 sq. ft. building on 8th St. and operates two extrusion presses.

Extruded aluminum **fascia track,** made by John Sterling Corp., Richmond, Ill., is heat treated for extra strength.

The Aluma Tan **Foil Screen** concentrates three hours of sun bathing into one, according to Aluma Tan Co., 425 N. Washington, Minneapolis, Minn. The tanning unit consists of 6 steel posts, three sections 3 by 4-ft. each, and three spreaders for rigidity. Reflectivity of the aluminum concentrates the sun's rays.

Zero Mfg. Co., 1121 Chestnut St., Burbank, Calif.



WEIGHT WATCHERS SEND FOR THIS BOOK

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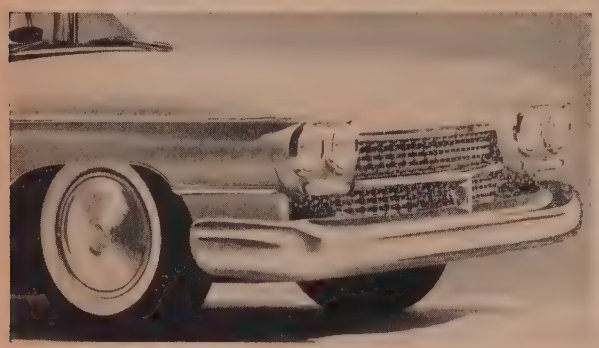

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Alchemize Corporation, 625 S. Kolmar at Congress Expressway, Chicago 24, Ill.

has added **magnesium containers** in over 40 sizes to its line of similar aluminum boxes and covers. Joe E. Daniels, vice president in charge of sales, said other sizes will be added later. Zero, in collaboration with Dow Chemical Co., developed the deep-draw process used in making some types of the containers.

Aluminum **magnet wire** is being marketed at a price which reflects the economy of aluminum over copper wire by Rea Magnet Wire Co., Inc., Fort Wayne and Lafayette, Ind. Potential uses are in motors, solenoids, and generators. AWG sizes no. 12 through no. 24 are available.

A self-contained air or gas powered **instrument drive** and timing unit utilizes aluminum in all parts exposed to gas. The Gasclok Power Drive, which is said to deliver a constant power output of more than 20 times the torque supplied by spring-wound clock mechanisms, can be used with all types of instruments requiring chart records from one-hour to 30-day periods, according to its manufacturer, American Meter Co., 920 Payne Ave., Erie, Pa.

Wide face drawn circle top **doors** are custom-made in aluminum by Diamond Mfg. Corp., 66-84 74th St., Middle Village, N.Y.

Prefabricated **boat houses** are made by Blanton Plow Co., Rome, Ga. They are covered with .024 aluminum corrugated roofing sheet applied to steel trusses spaced eight feet apart.

All-aluminum exterior eliminates maintenance and adds to the appearance of the Scotty Sportsman Senior **Travel Trailer** made by Serro Travel Trailer Co., 106 Arona Rd., Irwin, Pa. Senior model has living accommodations for four people; junior model, for two.

Midland-Ross Corp., Division and West 106th, Cleveland, Ohio, has acquired all assets of Nelson Metal Products Co., Inc., of Grand Rapids Mich., producer of **aluminum** die castings for the automotive industry.

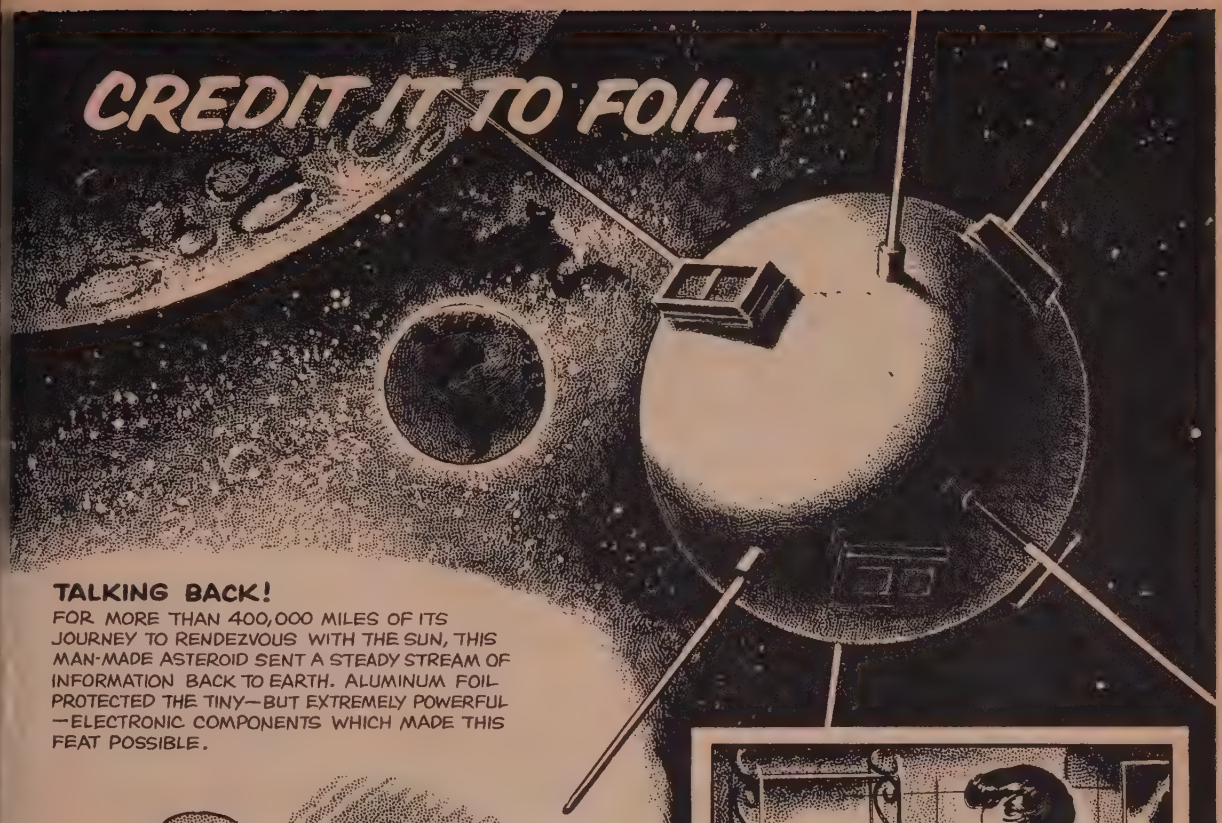
Portable vacuum cleaner made by American Cleaning Equipment Corp., 1600 S. Dearborn St., Chicago 16, comes equipped with a 12-inch **aluminum nozzle.**

Anodized aluminum **lighting louvers** for louvered ceilings or diffusers in lighting fixtures are a product or L. J. Segil Co., 2500 W. North Ave., Chicago.

Aluminum is one of the materials in which the Challenger Lock Co., 4865 Exposition Blvd., Los Angeles 16, Calif., makes its "Flite" **escutcheon** for both right and left-hand doors.

Aluminum foil serves as a stiffener between layers of glass cloth and highly absorbent glass fiber "wool" in new **evaporator plates** for furnace humidifiers made by Auto-Flo Corp. 12085 Dixie, Detroit, Mich. "The glass fiber and foil materials are quilted together easily by sewing," Kaiser Aluminum & Chemical Corp. supplier of the foil, reports. "Drain clips attached to the shoulders of the plates are also aluminum."

CREDIT IT TO FOIL



TALKING BACK!
FOR MORE THAN 400,000 MILES OF ITS JOURNEY TO RENDEZVOUS WITH THE SUN, THIS MAN-MADE ASTEROID SENT A STEADY STREAM OF INFORMATION BACK TO EARTH. ALUMINUM FOIL PROTECTED THE TINY—BUT EXTREMELY POWERFUL—ELECTRONIC COMPONENTS WHICH MADE THIS FEAT POSSIBLE.

METAL MULCH
AID BETWEEN PLANTS, STRIPS OF ALUMINUM FOIL EDUCE WEED GROWTH, PRESERVE MOISTURE, AINTAIN COOLER ROOT TEMPERATURES, PROMOTE APID GROWTH.

NO COMMERCIAL
A HOUSEHOLD CLEANSER IS MARKETED IN A 3-CAN MULTIPACK. ONLY THE CARTON DOES THE "SELLING". THE CANS ARE SIMPLY COATED WITH COLORED ALUMINUM FOIL—TO LEND "DECORATOR" APPEAL.

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Alcoa, 1960: A BILLION DOLLAR BABY

The recession of 1957-58 hit the primary aluminum producers at a time when their greatest expansion effort was bringing new capacity on-stream. Demand declined; profits plummeted; capacity kept climbing; and stiff competition became a stern reality. While the slump has ended and aluminum sales are at new highs, still more capacity is under construction, and new markets will be needed to absorb the metal. To get an idea of what's being done by the biggest aluminum producer, we recently spent a week talking to Alcoa's top management men. We came away convinced that their research, product development, promotion and sales activities will soon elevate Alcoa to the select billion-dollar sales club, and will also benefit the entire aluminum industry for years to come.

W. B. Griffin, Publisher

June 1st: VERY LITTLE HEDGE BUYING IN THIS AREA. . . . GENERAL TONE OF BUSINESS EXCELLENT. . . . SHEET ORDERS FOR RESIDENTIAL SIDING AND IRRIGATION TUBE SHOWING STRONG UPWARD TREND. . . . ALUMINUM CONDUIT BUSINESS RUNNING STRONG. . . . DEFINITE INCREASE IN ORDER RECEIPTS THIS WEEK, WITH IMPROVEMENT LARGELY FROM PRINCIPAL ACCOUNTS. . . . UTENSIL INDUSTRY STILL GOING STRONG; NO INDICATION OF SUMMER DROP-OFF. . . .

BOOKINGS THIS WEEK IN OUR AREA 240% ABOVE LAST YEAR'S AVERAGES. . . . FURNITURE BUSINESS NOW AT HIGH LEVEL. . . . ALL MAJOR AUTO FIRMS HAVE ALUMINUM ENGINES IN TEST; MOST PLANNING V-8 ENGINE BLOCKS AND CYLINDER HEADS FOR '61. . . . TUBE BREAKING ALL PREVIOUS RECORDS. . . . DOLLAR VALUE OF PAST FIVE WEEKS ORDERS 40% HIGHER THAN IN SAME WEEKS LAST YEAR. . . .

HAVE A LARGE ORDER FROM CAN MANUFACTURER FOR IMMEDIATE DELIVERY. . . TWO NEW AUTO PARTS TOTALING 20 POUNDS PER CAR ARE POSSIBILITY FOR '61.

MAY WAS BEST MONTH IN THIS OFFICE SINCE 1957. . . . SHEET AND EXTRUSION MILLS OPERATING WITH FULL SCHEDULES. . . . OUR MANAGERS' MEETING WAS THE MOST OPTIMISTIC IN THE PAST TWO YEARS. . . . GOOD FOURTH QUARTER FOR GENERAL ECONOMY A REAL POSSIBILITY. . . .

While there are also some negative ripples on Alcoa's business stream, the foregoing summary accurately reflects today's aluminum picture as reported to Frank Magee, president and chief executive officer of the world's largest aluminum producer.

Aluminum is riding high on the comeback trail. Commercial demand started to perk up late last year; gained momentum in the first quarter of '59. The mid-year outlook for Alcoa shows business up 25% over the year-earlier rate.

With the recovery out-pacing original expectations, Alcoa has boosted output to 82% of capacity; may activate still more capacity if the up-trend continues.

Thus, in only three months, the emphasis has switched from seeking out new immediate business to producing with reasonable delivery for the demand which currently exists.

This is a far cry from the business atmosphere that prevailed when Frank Magee took over as Alcoa's president in September, 1957. While Alcoa's slump actually began in July, '57, it was gaining considerable momentum when Magee was elevated from executive vice president to president.

At that time Alcoa and the rest of the aluminum industry appeared to be in serious trouble. The recession of 1957-58 caught the producers in a vulnerable position. Demand for aluminum started to slide fast just as the industry's greatest expansion effort was bringing new capacity into production. Gone was the decade-long period of spiraling demand. Gone were the profit-happy days of 1956. And on the way out were many salesmen who could only sell when orders were "phoned in."

The Earnings Picture

In 1956, Alcoa netted $90 million on near record gross revenues of $86 million, making it the company's most profitable year.

But when the economic tide turned in mid-1957, aluminum firms were hit harder than most basic industries. The reasons were complex, and they varied from one producer to another. In Alcoa's case, several factors combined to push profits down to $75 million in 1957 and to $42.8 million in '58. The downtrend even continued into the first quarter of this year, dropping earnings to $10,725,000 — about 10% below last year's first period (see Table 1).

Paradoxically, a few factors that contributed to this gloomy picture are actually sources of future strength. Take, for instance, Alcoa's "sum-of-the-year's-digits" method of calculating depreciation. The usual straight-line approach would have held down plant amortization in these early years, only to defer this drain on income until later years.

With Alcoa's conservative depreciation policy, the picture is reversed. "You don't look as good at first," Frank Magee admits, "but it'll pay off in the long run. Helps stem inflation, too."

In other words, Alcoa has its sights

ined on the future. A decade ago, en gross revenues totaled around 50 million. Alcoa channeled 4½% of se revenues into amortization and de- eciation. Last year, when gross reve- es topped $758 million, 8½% went to these balance sheet items — a high tio for a basic materials producer.

By the end of this year, Alcoa's total sets will top off at nearly $1.5 billion better than triple the company's $417 illion valuation at the end of World ar II (see Table 2). Outlays for new cilities have dropped from $81.6 mil- on last year to around $65 million in 9.

In short, Alcoa's policy of "present crifices for future gains" will start ying off in terms of well-amortized ant and improved cash reserves in the xt few years.

upply Contracts and rice Reduction

Another profit depressant has been lcoa's supply contract with Aluminium imited. During the post-Korean War ortage, the company signed a contract r 600,000 tons of Canadian aluminum.

"This contract served the metal- arved American market very well for ree years," Magee said, "but when uminum came into long supply in late 56, it became a millstone around lcoa's neck. The contract was originally heduled to expire in mid-1958, but as been stretched out by negotiation that deliveries will be made to Alcoa rough 1961."

The imported metal probably cost lcoa about $10 million in 1958. Not nly does this contract cut into profit, ut Alcoa also has to absorb the metal n its own system at a time when supply running well ahead of demand.

"But the worst of it will be over this ear," says Magee.

Probably the most telling blow against rofits was last year's industry-wide 1.3- ent reduction in the price of alumi- um. This alone lopped approximately 18 million off Alcoa's revenues.

And finally, Alcoa's supply contract ith the government ran out in '58. overnmental authorities also reduced ne amount of surplus metal eligible or stockpile delivery by virtue of Al- oa's contracts to buy foreign metal.

The loss of this additional anticipated ncome hurt last year's profit picture lenty, and the expiration of the con- ract kicked a hole in this year's first uarter earnings.

One Wall Street analyst thinks that lcoa's lower sales and earnings are due, n part, to its policy of sticking close to published prices despite severe price-cutting elsewhere in the industry. This attempt to forestall price anarchy probably penalized Alcoa by throwing some business to competitors.

Price Cutting

Frank Magee is adamant on this point. "We won't be a party to any discriminatory price reductions," he insists. "Aluminum's list prices are already too low without undercutting to obtain spot business. Pushing the panic button to reap a few immediate gains is short-sighted, because an unstable price structure can only retard the industry's growth and eventually hurt everybody — especially the little fellow.

"Price-cutting is the biggest problem in the aluminum industry today," Magee asserts. "A lot of people blame it on the immaturity of our industry. In some respects this is true, but I believe it is due to the fact that too many firms with full order books bought too much equipment and financed too far out on a limb during the past decade's boom. Others believed the industry was a big 'green field' in which anyone could graze, minus competition."

Some of Alcoa's competitors are forced to get business at any price to keep their plants open, according to Magee. If the money stops coming in, they are in trouble.

Some old-time Alcoa men reason that if some in the industry are so anxious to commit hara-kiri, then Alcoa should calmly sit back and wait. They vividly recall similar price-cutting sprees in the '20's and '30's in the copper industry. The most irresponsible price-cutters eventually ran into difficulties, and prices began edging upward.

"The trouble is that Alcoa's prices are used as a base from which to cut," comments Magee. "The non-integrated aluminum firm is often a free-wheeler who can choose his spots to do price-cutting. But I can't agree that Alcoa should meet every price, regardless of the cut. I'd like to see more stability start from others."

Magee is concerned over the growing trend toward the so-called commodity prices in aluminum. He believes that the metal is now priced too low; that of both metal and mill product facilities, the return on the invested dollar is too low.

"We believe in healthy, all-out competition, but salesmanship should be the order of the day if we are to build permanent markets. Our hope is to put aluminum on a higher plane; to sell

■ *Frank Magee, president and chief executive officer of Alcoa (standing), and I. W. Wilson, chairman of the board.*

Table 1 — Alcoa's Gross Revenues and Net Income, Before and After Taxes, 1946-58

(millions of dollars)

Year	Gross Revenues	Net Income Before Taxes	Net Income After Taxes
1946	300.6	27.5	24.3
1947	386.0	50.3	29.4
1948	439.1	68.6	40.6
1949	346.6	37.0	20.9
1950	481.2	90.9	46.9
1951	539.6	116.9	39.9
1952	584.0	100.1	47.4
1953	711.1	128.5	60.5
1954	713.0	119.5	61.9
1955	848.7	176.9	87.6
1956	869.8	174.6	89.6
1957	875.5	144.6	75.6
1958	758.1	74.4	42.9

NOTE: Years 1951-1955 adjusted to reflect depreciation based on economic useful life of facilities.

its virtues to develop new markets; to even out the peaks and valleys of the seasonal industries."

Some competitors claim that Alcoa's promotion of its customers' products on TV, radio, and in the press is merely a price-cutting gimmick in disguise. Alcoa counters this with the argument that wider publicity and advertising stimulate new markets and increase demand, thus benefiting the industry.

"The success of these promotional efforts is shown in the increased use of aluminum per unit of output of many consumer durable goods last year during a period when production of such products was sharply curtailed," Magee adds.

With the worst of the profit-killing pressures on the wane, Alcoa will turn in a much better performance from now on. Though first quarter earnings were disappointing, the company may well have made $16 million in the second period; stands a good chance of netting close to $60 million in '59.

Alcoa is ready to knock on the door of the billion-dollar sales club; may well gain entry into this select group next year if aluminum demand keeps growing at its present pace.

"Trimming the Sails"

Except for a few interludes of softening demand in the 1947-57 decade, most Alcoa plants were pushed to capacity throughout the postwar period. Then, as demand skidded, production of primary metal was cut back — to 712,000 tons in 1957 and to 520,000 tons last year.

With demand down and capacity up, management realized that it had to improve efficiency and delete all unnecessary jobs. Alcoa worked to obtain the understanding of the entire labor force, pointing out that tougher competition, combined with reduced sales, would automatically eliminate jobs.

"Our extrusion plants were hit hardest due to extreme price cutting throughout the industry," Magee recalls. "We had to increase manhour efficiency, sell higher quality than ever before, and at increasingly competitive prices. This was the only way we could keep these plants operating.

"We also improved our plant procedures, replaced obsolete equipment, thereby reducing our maintenance costs, and have continued to mechanize our paper work," he added.

Paper work is one of Alcoa's costliest operations. Last year the company started a new five to ten year mechanization program which will involve the use of integrated data processing equipment that is expected to improve the efficiency of selling, scheduling, and production planning.

The cost of setting up the system in one plant may vary between $20,000 and $40,000 a month for a long time, but the savings in manpower and money can add up to millions of dollars a year. For example, Alcoa foresees a 160-man scheduling unit reduced to 65 people. The work will be more accurate and done so rapidly as to substantially reduce the time between order-taking and shipment.

"We've cut costs all down the line, tightened up the whole organization, and laid the foundation for a substantial increase in sales," comments Magee.

The reduction of operating costs is one of those prosaic internal matters that receive little attention in the press — or in the company prospectus of the average investment broker. But it can pack a wallop when the balance sheet is made up at year's end.

Equipment and Productivity

But Alcoa's best chance to "keep a step ahead of inflation" lies in the installation of advanced equipment and processing methods that will counteract the rising cost of labor. As executive vice president, M. M. Anderson, points out: "Average hourly earnings of Alcoa's workers are now 180% higher that they were at the end of World War II, and this only represents increases in wages. When fringe benefits are included, Alcoa's total employment costs during this period have increased 220%. Today they are around $3.40 per hour per worker.

"In order to remain competitive with other materials, we are constantly looking for ways to increase productivity — and that includes machinery, supervisory and executive talent, and all the other input factors that are instrumental in improving productivity. Only by keeping our costs down can we continue to sell aluminum at competitive prices."

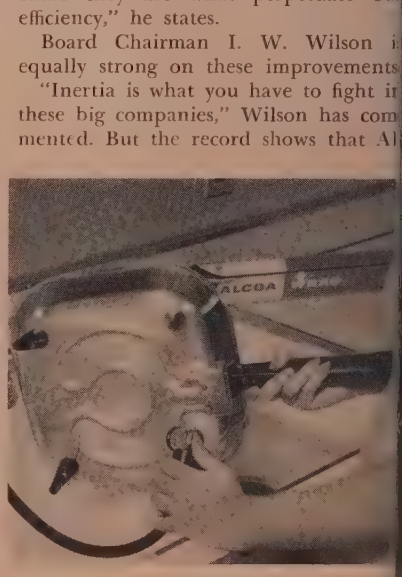
Last year about $65 million was spent on improved equipment and processing methods alone, and hardly anyone in the company would call a halt to this improvement program.

"We have so many programs we don't know which to do first," Anderson points out.

Magee is quick to agree, stating: "We can't afford bottlenecks. That's why I'm particularly pleased about the recent changes in the geography of our top management. With three executive vice presidents we can expedite important policy decisions in all phases of our business."

According to Magee, Alcoa has hundreds of important equipment purchases and process improvements on the agenda. "Our plants are continually suggesting worthwhile cost-saving projects, and we consider all of them because they are what perpetuate our efficiency," he states.

Board Chairman I. W. Wilson is equally strong on these improvements. "Inertia is what you have to fight in these big companies," Wilson has commented. But the record shows that Al



■ ***Alcoa uses its new "pressure bonding" process to join this aluminum fry pan base to the stainless steel cooking surface for Toastmaster Division of McGraw Edison Co.***

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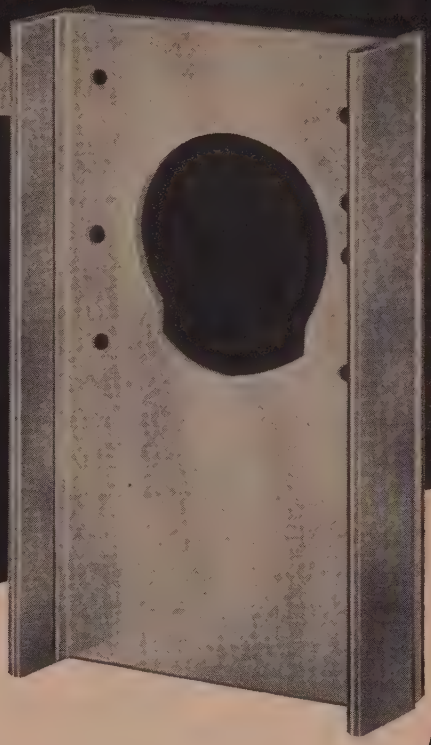

General extrudes this part, cuts to size, blanks and drills, then painstakingly hand polishes, chemically bright dips and gold anodizes . . . with an end result which proves again that aluminum can be richly beautiful, suitable for any environment.

The unblemished, soft gold finish of this part is truly attractive. It has to be because this is a thermostat housing for air conditioning systems that finds its way to the walls of fine homes, exclusive clubs, hotels, restaurants and other such establishments. Manufacturer of the air conditioning controls is White-Rogers Co., St. Louis, Mo.

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coa has been quick to gear its operations to changing economic or market conditions.

Up to World War II, for example, all aluminum reduction plants operated on hydro-electric power. But in 1942, Alcoa pioneered the use of natural gas for power in the Jones Mills, Ark. plant which was designed, built and operated for the government by Alcoa.

Then in 1950 Alcoa began using natural gas for power in Texas. Other aluminum producers followed suit during the Korean conflict; in fact, the biggest plant in the U.S. was built around gas as fuel.

Power: Changing Emphasis

Two years after its first venture with gas, Alcoa went a step further and turned to low grade coal — lignite — for power. This pioneer venture proved to be so efficient that the company later upped the plant's capacity by 50%.

And just two years ago Alcoa completed this power cycle by starting construction of its huge Warrick, Ind. smelting plant which will use high grade coal. When this plant soon gets into operation, it will doubtless be Alcoa's most efficient smelter.

Thus, in only ten years, Alcoa has tapped every source of power except the atom and made a systematic change-over from water-based to steam-based power.

The price of power, although increasing, is a declining factor percentage-wise in aluminum production, according to Magee. Obsolescence write-off is now almost as important, and proximity to markets is the big consideration. For example, the smelting plants in the Pacific Northwest have very low power costs, but they are a long way from the major markets, hence, transportation costs are high; are probably out-dated.

With its lignite and gas reserves in Texas and its huge coal reserves in the midwest, Alcoa is in a strong position, power-wise. It owns enough coal in the midwest alone to run four Warrick-size smelters for at least 60 years.

"We can move with assurance into any market because we can locate smelting plants without concern for water as power," Magee explains. "And with coal we can stabilize the cost of our power for years to come. We expect to further improve the efficiency of steam power plants and to lower the power consumption per pound of aluminum produced."

Alcoa's policy has been to build its own power facilities wherever possible, thereby protecting its smelting plants with a continuous low-cost power supply. While Magee admits that investment costs for power facilities are high, he feels that this high initial investment means the best possible average cost over a period of years. "Ownership of most of our generating facilities and underlying fuel supplies assures low-cost production for future generations," he believes.

Alcoa men feel that atomic powered aluminum plants are still some time away, but they are definitely interested in nuclear power. Magee considers atomic energy the only power source that can entirely free aluminum producers of their dependence on location. "You could almost build a plant on Madison or Michigan Avenues," he points out.

As for raw materials, Alcoa looks ahead with confidence even into the distant future, particularly with regard to bauxite. The combination process which Alcoa invented and developed to commercial use, and which is used by the Reynolds and Alcoa plants in Arkansas, made it possible to use bauxite previously considered completely non-commercial.

According to executive vice president Lawrence Litchfield, Jr.., substantial reserves of bauxite suitable for this process remain in Arkansas. Pointing out that Alcoa has made substantial additions in the past few years to its already extensive reserves of bauxite, Litchfield states flatly that "with holdings in Suriname, South America, Dominican Republic and Central Am ca, in addition to those in Arkan Alcoa has no worries on the raw m rials score."

■ ***Man in a hurry: Alcoa's president chief executive officer, Frank Magee, l ing the Alcoa Building.***

Research and Development

"Each year we look for more dol and more people for research than did the year before," says Frank Ma "and if we are to keep getting share of the aluminum business, activities in this area must increase more. Fundamental research is im tant, but we must also keep our on the end-use field. Somehow we m weave our technical research in w that which will induce the consu to buy more aluminum."

The continuous growth of Alcoa's search and development activities the past 40 years has required the velopment of organized effort in pl of the free wheeling, somewhat dec tralized policy of the early years. To Alcoa's activities in the field are ordinated by a management commit chairmanned by former chief metall gist, T. W. Bossert, who has since b made a vice president.

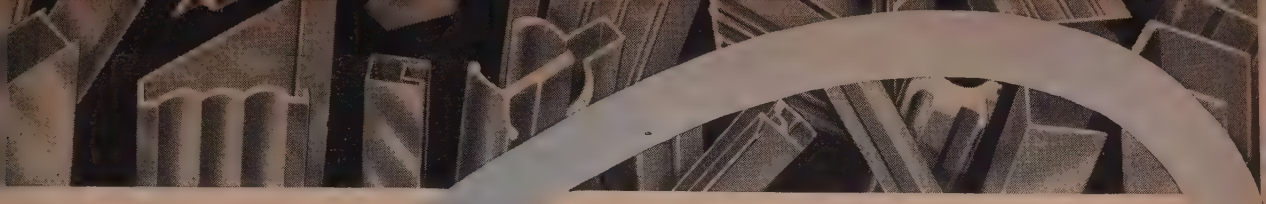
Frank Magee believes that resea and development encompass mat of management, production and sa

(Continued on page

Table 2 — Significant Alcoa Balance Sheet Items 1946-1958

(millions of dollars)

Year	Total Assets	Net Plant	Capital Expenditures	Long-term Debt	Net Worth
1946	$349.9	$143.5	$34.0	$ .5	$286.9
1947	430.1	209.5	80.0	80.7	269.4
1948	503.6	271.2	77.6	120.5	297.8
1949	525.9	316.6	68.6	140.2	306.4
1950	575.3	325.9	34.7	146.3	341.0
1951	641.5	379.6	79.7	123.6	360.6
1952	874.7	545.3	198.3	325.9	391.3
1953	938.0	621.1	119.4	294.7	435.3
1954	982.2	640.9	67.2	336.4	486.3
1955	1,010.5	665.0	79.5	308.4	555.1
1956	1,157.6	744.7	139.3	273.3	621.1
1957	1,315.6	884.2	207.5	358.9	670.5
1958	1,337.3	892.4	81.6	462.7	687.1



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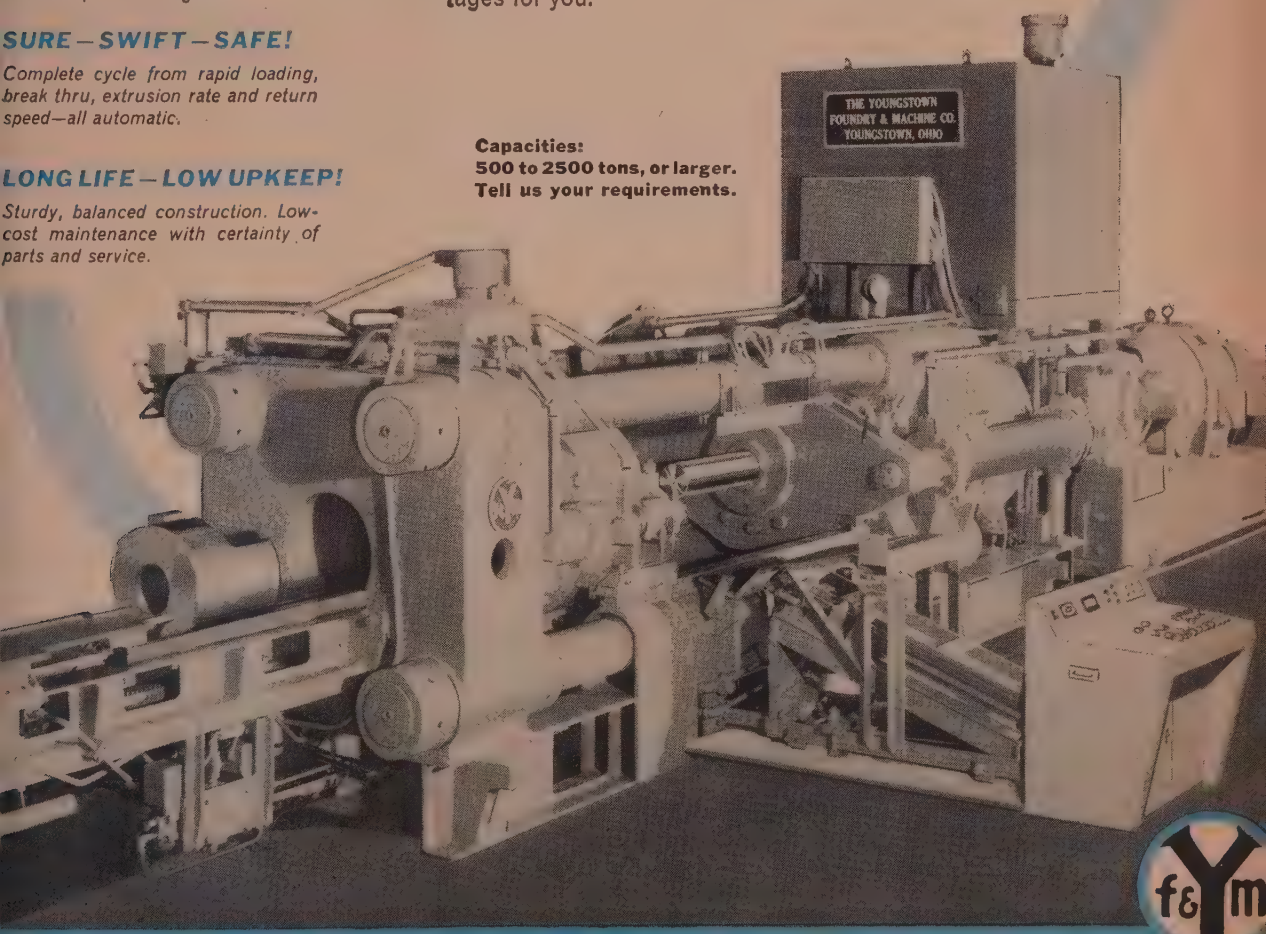

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"It's a sometimes nebulous organization which must have top management authority in order to remain independent. Nevertheless we must be realistic and make sure that we get the most for each research dollar, and in the shortest possible time."

Coordination of individual efforts into purposeful developments is a major justification of the R & D committee. With membership made up of top people from the technical, sales, production and management areas, the committee formulates a broad policy on which projects would be profitable; which should be urgent.

"Time is our greatest single problem," Magee emphasizes. "We all realize that R & D implies time-consuming activities, but it must be streamlined. What we are presently attempting — and what the committee can accomplish — is to get from starting point to objective as quickly as possible. By stimulating interaction and exchange between departments, developments in one area can often be put to significant use in another, thereby avoiding duplication."

In a management audit on Alcoa three years ago, the American Institute of Management reported: "The company does more than three-quarters of all the research conducted today in the aluminum industry in this country, even though it has less than one-half of total production. Its research climate is one of the very best to be found anywhere. . . . Alcoa already spends a larger percentage of its gross on research than possibly any other metal company. . . . Considerably more would be spent if suitable research personnel could be found."

■ ***Leading personalities in Alcoa's outstanding R & D activities have been Dr. Kent Van Horn (left), who heads up Alcoa Research Laboratories, and T. W. Bossert, vice president in charge of research and development.***

Last year, Alcoa spent nearly $16 million on R & D and has upped the budget this year to $18 million.

Research and development in Alcoa can be categorized under the following headings:

A. Fundamental research — projects that represent original investigations for the advancement of scientific knowledge and do not have specific commercial objectives.

B. Applied research and development — projects involving application of basic scientific principles to the manufacture of new products, new and improved processes and equipment.

C. Technical service — an expansion of Alcoa Process Development Laboratories which eventually will be emphasized through the establishment of a vast new technical center to which Alcoa can take any customer and teach him the best fabricating and finishing techniques for his particular product — or even help him redesign it on the spot. This is the most ambitious project ever conceived by a materials supplier.

D. Exploration — activities concerned with the discovery and delineation of new supplies of raw materials and fuels, to insure continued supplies for the future.

First Research

Organized research and development in Alcoa started in the 20's when a large portion of R & D was concentrated on new alloy development. The

Table 3 — Functions of Alcoa Research Labs

The work of Alcoa Research Laboratories is presently done in 16 separate divisions. But, as Dr. Van Horn states, "More divisions will be formed as needed. Also more emphasis will be directed to fundamental research in certain areas." Here are the present 16 divisions:

1. Alumina and Chemicals: Main projects center around work on refining of bauxite and other aluminous ores to produce pure alumina.

2. Analytical Chemistry: Major work is development of new and improved analytical methods for Alcoa's 30 plant labs.

3. Chemical Metallurgy: Fundamental investigation of corrosion, particularly stress corrosion, and development of preventative measures.

4. Cleveland Research: Applied research on casting and forging alloys and processes is carried on in two separate labs.

5. Electrical Engineering: Major investigations into vibration characteristics and mechanical and electrical properties of electrical conductors, fittings, accessories.

6. Engineering Design: Rules for structural and mechanical design for aluminum and magnesium alloys used in stressed structures. Assistance to customers in designing machines and structures.

7. Fabricating Metallurgy: Development of new and improved aluminum alloys and fabricating procedures — melting, casting, rolling, heat treatment and aging.

8. Lubricants: Fundamental investigation of the theories of lubrication and the development of improved lubricants and lubricating practices for Alcoa's metalworking operations.

9. Mechanical Engineering: Theoretical and applied engineering research. Improvement of metalworking processes in Alcoa's fabricating plants are the major functions.

10. Mechanical Testing: Theoretical and applied research on mechanical testing methods and on adapting methods to new applications.

11. Metallography: Fundamental and applied research in the field of physical metallurgy, using optical and electron microscopes.

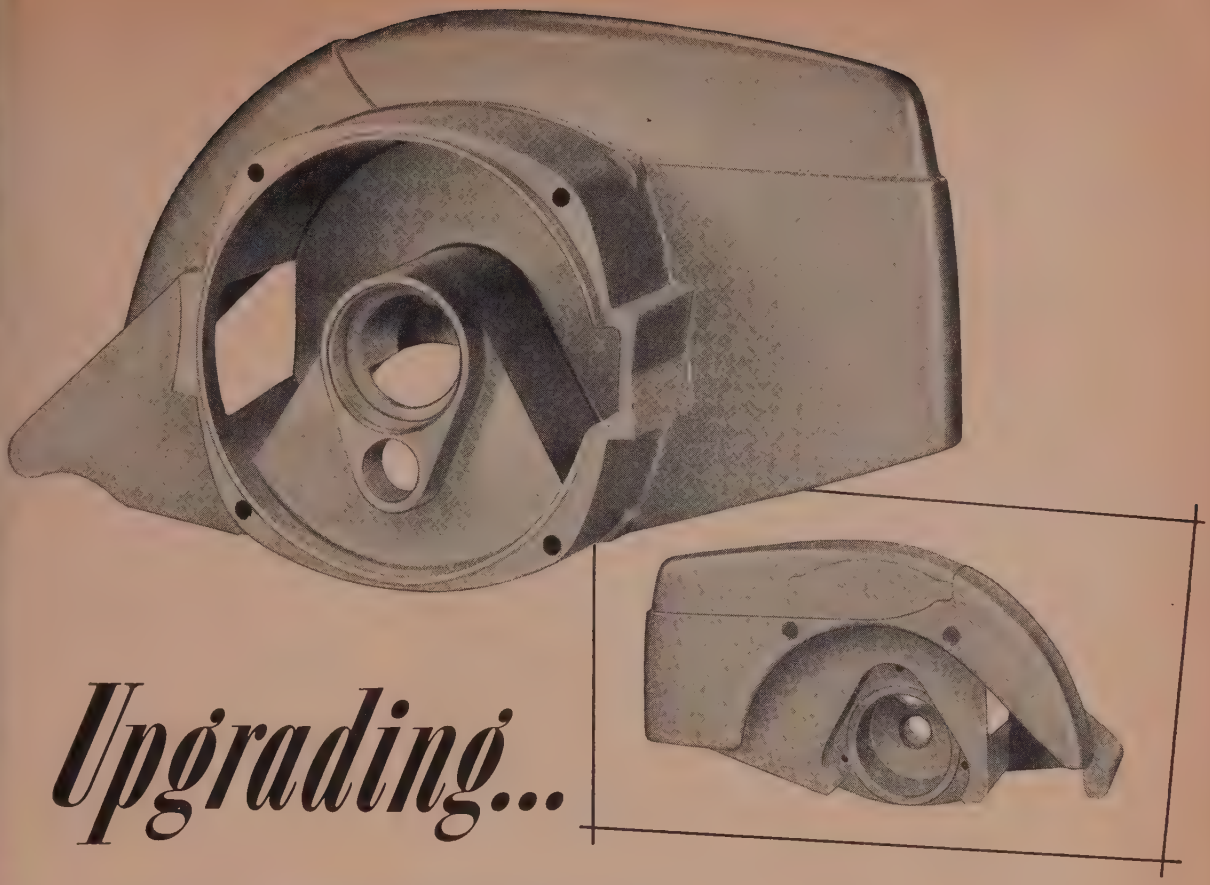
12. Finishes: Development of aluminum powder as a pigment, plus development and evaluation of paints for protection and decoration of aluminum. Also work on chemical, electrochemical and porcelain enamel finishes for aluminum alloys.

13. Physical Chemistry: Long-range research such as on fused salts to understand properties of cryolite and the electrochemical production of aluminum. Other projects include the behavior of gases in aluminum.

14. Physical Metallurgy: Long-range alloy developments, metal flow, recrystallization, etc. Also nondestructive testing of alloys.

15. Process Metallurgy: Search for improved smelting, melting, refining methods. Research into all types of metal joining. Also organic chemistry.

16. Foil and Packaging: New division works on methods to promote use of aluminum in packaging. Employs packaging and printing machinery, as well as laminating and package evaluation for customers. (It is in this type of area that Alcoa plans to broaden its research activities.)



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idea then was that if a new alloy was developed, a use for it would come along. (Alcoa still has alloys for which no use has been found.) At that time there was little, if any, coordination among the various departments.

During the depression, when not much money was available, Alcoa began taking a closer look at research. Because there was no assurance that research money was being spent in the most efficient manner, and because it was impossible to nail down how much was being spent on what projects, a budget was set up for the first time to cover the activities of the Alcoa Research Laboratories, then called the "Research Bureau."

During the next seven years seven other research and development areas were embraced, and the management formally set up a Technical Committee and now, at last, research and development time and money were to be budgeted for top priority items.

As the scope of the Technical Committee grew, it became necessary to develop numerous subcommittees to distribute its responsibilities.

Under the present system, 15 subcommittees establish goals and priorities, so that first things are done first. All management phases are represented, from basic production through sales. There is, therefore, a balancing emphasis on all facets from raw materials to final market development.

Recently the Technical Committee was renamed the Research and Development Committee in order to clarify its interests and responsibilities. Today this committee reports to the top management Technical Policy Committee, which in turn reports directly to Magee. Ralph Davies, vice president and general sales manager, is chairman of this committee.

Alcoa Research Laboratories

Sprawled around Cleveland, East St. Louis, Chicago, Massena, N. Y., and New Kensington, Pa., are 16 divisions of Alcoa Research Laboratories (ARL), the formal core of the aluminum industry's greatest research and development organization. While at least 1500 people are engaged in research and development throughout Alcoa, 800 of them work solely within ARL.

More than 400 projects are in various stages of active investigation, and perhaps an additional 200 are awaiting attention, shelved only because of inadequate space and personnel.

Half of Alcoa's $18-million research budget is earmarked for ARL, making it the largest research organization with the biggest budget of any basic materials producer. Basic materials producers allot about 0.5% of sales for research; Alcoa sets aside 2%.

■ ***After a dozen years of research, Alcoa Research Laboratories have come up with a formed fin material which will make aluminum competitive with copper and brass in automobile radiators. An aluminum radiator such as the one shown here would average 20% less in raw material cost, weigh 20% less than conventional units, and require only minor changes in manufacturing procedures, according to ARL.***

This continuous, imaginative, and costly research and development activity over the years has made possible the penetration and cultivation of greatly expanded markets for aluminum. It has paid off so well for Alcoa that the company is laying plans for a research center that will be topped by none other in the world.

The high esteem in which ARL is held was well expressed last year when the U. S. Navy's Distinguished Public Service Award was presented to E. H. Dix, Jr., then Alcoa's assistant director of Research. Said the Hon. Garrison Norton, Under-Secretary of the Navy:

"We may say with justice that the position of the U. S. today in the quality and capabilities of its aluminum alloys is due primarily to the achievements of the Alcoa Research Laboratories."

The groundwork for this national recognition was laid 40 years ago in an old remodeled factory, when Dr. Francis Frary and a small group of researchers started Alcoa's first formal research department in New Kensington, Pa.

Two years later a second center was established in Cleveland, specializing in casting research. Three years after that a third research group was authorized in East St. Louis to work on problems concerning alumina and chemicals. An electrical conductor laboratory took shape in Massena four years later. Expansion continued so rapidly that by 1929 a separate main laboratory building was erected at New Kensington.

Top research demands top people, and Alcoa's continuous search for researchers anticipates greater things to come. Of the 800 people employed in the research labs, about 300 are professionals, the remainder being laboratory technicians and other personnel. There are twice as many technicians and office help as research scientists and engineers so that the scientists may devote a maximum amount of their time to professional research work.

About 14% of the professionals have doctors degrees; 19% have masters; and 67% have bachelor degrees. Alcoa offers a tuition-aid plan for those who desire further education, and another lure for promising researchers is an interest-free educational loan fund.

Major Research Contributions

Evidence that Alcoa has educated its scientists well is shown by some major contributions to come out of ARL:

During World War II, when it was feared that high grade foreign bauxite might be cut off by enemy action, Alcoa came up with a combination process for making alumina economically from low-grade American bauxite. Both Alcoa and Reynolds Metals utilize this process in Arkansas.

ARL has also developed practically all the aluminum alloys in use today around the world — some 98 standard alloys, plus another hundred special or experimental alloys, including super-strength aircraft materials.

Outstanding alloy developments include: 2024, the strong aluminum-copper-magnesium alloy which was used for most aircraft sheet during World War II; 7075, a high-strength aluminum-zinc-magnesium structural alloy which went into the B-17's and the B-29; and X-2020, an outstanding new aluminum-lithium alloy that holds its strength at high temperatures in supersonic aircraft.

Other notable Alcoa alloy developments include: 6061, a formable heat-treatable alloy with high resistance to corrosion; 6063, the alloy used most by extruders for building applications; X5454, a weldable structural alloy with good elevated temperature properties for vessels, tanks, and piping; X5457, a new sheet alloy that takes a mirror-like finish for automotive and appliance uses; and X385, a high-strength die

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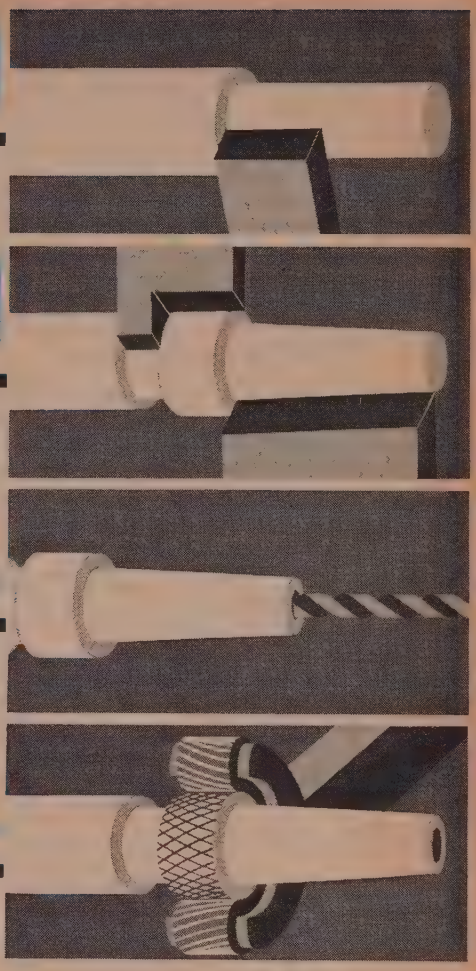

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■ *Power plant condensers represent a large potential market for aluminum tubing. A million pounds of tubing have gone into this application since Alcoa made the first installation in its Sandow power station (Rockdale, Texas) five years ago. Shown here is installation of aluminum tubing in a 75,000 sq. ft. condenser of the Armstrong Station of the West Penn Power Co., Reesedale, Pa. Aluminum was chosen after 4 years of Alcoa research showed that the material is suitable for handling Allegheny water at that point.*

casting alloy for bearings in outboard motor and hand tool applications. These are only a few; the list is legion.

Casting and Corrosion

Alcoa has developed and improved many processing techniques which are now standard practice in the industry. The D.C. (direct chill) method of making extrusion, rolling and forging ingots is a prime example. As vice president T. W. Bossert points out: "The larger the ingot, the more difficult the problem of attaining good metallurgical quality. The D.C. process permits the production of good ingots weighing over ten tons."

A significant advance in the art of casting was the development of plaster mold techniques which enable production of castings with exceptionally smooth surfaces and high dimensional accuracy. This process has been particularly important in the development of aluminum automatic transmission parts.

The Alclad process which provides electrolytic protection of a strong core alloy by cladding it during rolling or extrusion with another alloy or pure aluminum was another brilliant ARL achievement. Alclad products are widely used for numerous applications in the building, transportation, and processing industries.

In metalworking, the emphasis is on fostering new fabrication methods such as explosive forming, improvements in extrusion and forging processes, and advanced die design. As a result of its 20 years of work on coolants and lubricants, Alcoa now buys the raw materials and compounds a large proportion of its own process lubricants.

Alcoa has spent more than any other firm in the world to gain a greater understanding of the mechanism of corrosion in all atmospheres. This has resulted in an understanding of stress corrosion and development of methods of prevention.

Attendant to solving corrosion problems have been Alcoa's developments in protective and decorative finishes. Outstanding among these have been techniques for applying plain and colored anodized finishes to aluminum. Great contributions have also been made in chemical, paint, and porcelain finishes. In fact, ARL developed ready-mixed aluminum paint, along with the special powders and vehicles necessary to manufacture it.

Major ARL Functions

The two major functions of ARL are: develop fundamental information on the properties and characteristics of aluminum, aluminum alloys and aluminas; assist in developing new and improving existing processes and products to reduce costs, improve quality, and expand the markets for aluminum.

As research director Dr. Kent Van Horn explains: "All of our plants do their share of research and development, and after we have completed our part of it, both analysis and recommendations are given to the plants for applying these developments in operations. If the project involves a customer problem, we either take our ideas to the customer's plant, or, if possible, bring the customer to ARL."

The most urgent immediate projects in the field of products, according to Van Horn, involve improved finishing methods and finishing alloys, elevated temperature alloys for supersonic airframes, high-silicon hypereutectic alloys that can be used for cylinder blocks and brake drums, and foil laminations and off-set printing on foil.

ARL is presently working on a new type of adhesive that will do a better job of joining aluminum to plaster board. More attention is to be given to combining aluminum with other materials.

A significant example is a panel consisting of expanded plastic beads sandwiched between sheets of aluminum (see MM, Feb., '59). Called Alply, the panel offers greater simplification in the design and construction of appliances, trailer homes, etc. It possesses high strength, exceptional stiffness, and good dimensional stability, and can be textured, formed, and colored to achieve any desired decorative effect. Alcoa sees great promise for Alply in building and appliance applications.

ARL has also come up with a process for pressure bonding low strength aluminum bearing alloy to high strength castings and forgings. This shows great promise for uses where the base part requires high strength and where the surface must have outstanding bearing characteristics.

Alcoa's scientists and engineers are constantly working on continuous casting of stock for further fabrication, with an eye to casting shapes closer to the size required so as to eliminate excessive breakdown by rolling. The opportunity for a major reduction in the cost of fabricated products by this avenue is bright.

Alcoa sees a big future for the aluminum-magnesium alloys, and is currently continuing development in the

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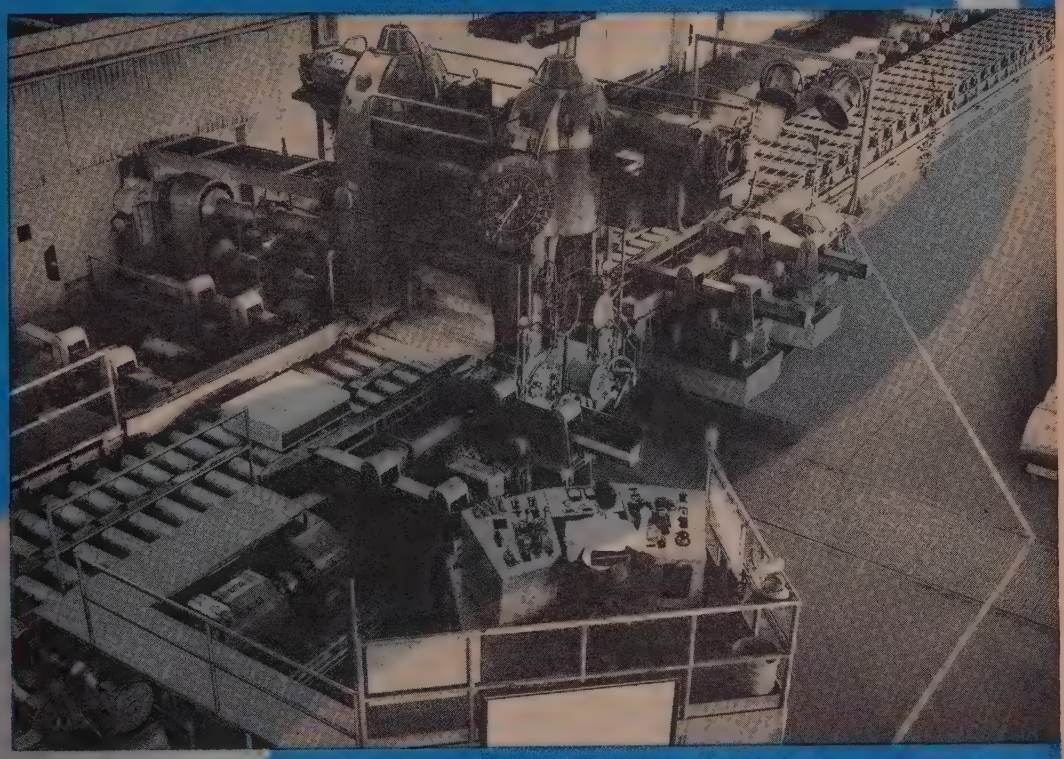

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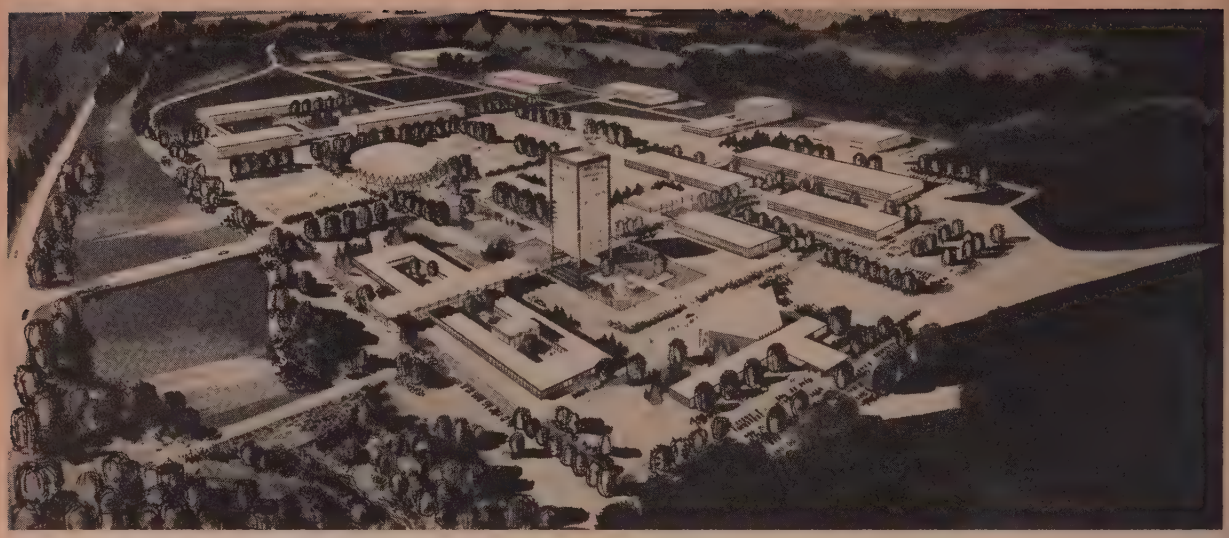


■ *Artist's sketch of one suggested plan for Alcoa's $30 million Research and Development Center, to be located on 2400 acres of land at Merwin, Pa. It will have complete "pilot plant" equipment for performing nearly any processing operation on almost any product, will serve as proving ground for customers' products and training center for Alcoa technicians.*

group of alloys that contain anywhere from 2.75 to over 5% magnesium. High strengths are obtained without heat treatment. These alloys have good welding characteristics and are resistant to corrosion; have top priority.

Alcoa is also doing major work in another area to solve the problem of improving performance of aluminum products subjected to high temperatures in service. It has been developing a line of aluminum powder metallurgy products (APMP) in the form of extrusions, forgings, sheet, foil, tube, fasteners, and wire. Some of these products can withstand temperatures up to 900 degrees F., a major breakthrough of the thermal barrier.

Made from fine unalloyed aluminum powder, these products are more stable at elevated temperatures than any solid aluminum alloy. They are cheaper and easier to fabricate than titanium, and have higher thermal conductivity than titanium or stainless steel.

"Our next logical step is to utilize atomized powders," explains Van Horn. "The resultant products would permit successful usage in higher temperatures than ever before. One big virtue of atomizing is that it permits alloying in much higher amounts than ever before, and the product is still easy to fabricate."

Corrosion: What Causes It; How to Prevent It

While Alcoa has perhaps done more on corrosion research than any other firm, it still feels that here is a major field of opportunity. "Once you know the mechanism and service conditions," says Van Horn, "you can select the proper alloy and, if necessary, inhibitors to alleviate or minimize corrosion."

He cites as an example the fact that ARL's labs have had aluminum pipes and valves as standard equipment since 1929. The Alcoa Building in Pittsburgh has aluminum piping. Use of the proper alloys, cladding and/or inhibitors for multi-metallic systems has resulted in completely satisfactory performance.

The advent of atomic reactors has posed new problems for metalworking firms. For example, it was surprising to find that the higher the purity of the aluminum the more the corrosion in the high temperature water reactor. Furthermore, it was learned that some aluminum alloys containing iron and nickel stood up very well and are currently being employed in several reactors.

Corrosion research has proved advantageous in Alcoa's work on hot water heaters. "We developed a new clad alloy," explains Van Horn, "and now can recommend its use in many parts of the country where corrosion has been a problem. Our biggest competition for hot water tanks has been galvanized and porcelain lined steel. Aluminum is proving it can do a better job because of the higher temperatures of domestic water now required by automatic dishwashing equipment."

Years ago, pitting of aluminum cooking utensils was a problem in certain areas of the country. Research revealed that this usually occurred in domestic water containing large amounts of heavy metals. Alcoa's continued studies of waters throughout the country have been extremely helpful in the development and promotion of aluminum water heaters.

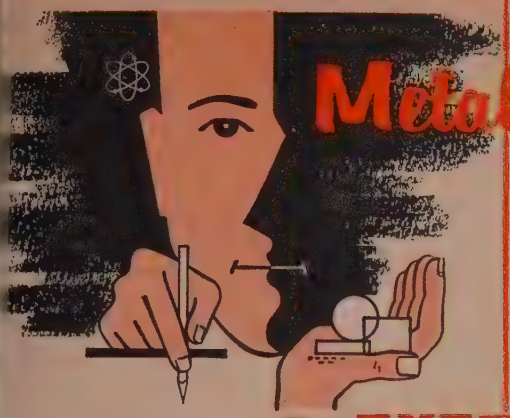
"As a result," says Van Horn, "this information has enabled Alcoa to attain an important share of this business. One major manufacturer now makes half of his domestic heaters out of aluminum. If we can convert the industry to this clad tank, this one market will use over 60 million pounds a year." Whether Alcoa gets all of this business or not, most of the major hot water heater firms are moving toward aluminum.

Another area in which Alcoa's corrosion research has been helpful is in the heat exchanger field. Aluminum heat exchangers for power plants have a tremendous future as a result of new alloy developments according to ARL. Aluminum costs about half as much as admiralty brass, and therefore represents substantial savings in heat exchanger construction.

Big: Aluminum For Power Plants

Perhaps even more significant is the competition that aluminum is beginning to give steel in condensate handling equipment for power and utility plants. Kent Van Horn sees a multitude of applications for aluminum in the thousands of utilities' plants throughout the country. Alcoa's goal is to make aluminum a major material of construction in power plants during the next few years, and to this end they are now working with many power companies.

Alcoa foreseees a major advance in the field of finishing aluminum. Great progress has been made in porcelain enameled coatings. Several years ago Alcoa developed a chemical treatment for preparing aluminum surfaces for enameling (R100) which eliminated a chemical bath and prefiring and cut



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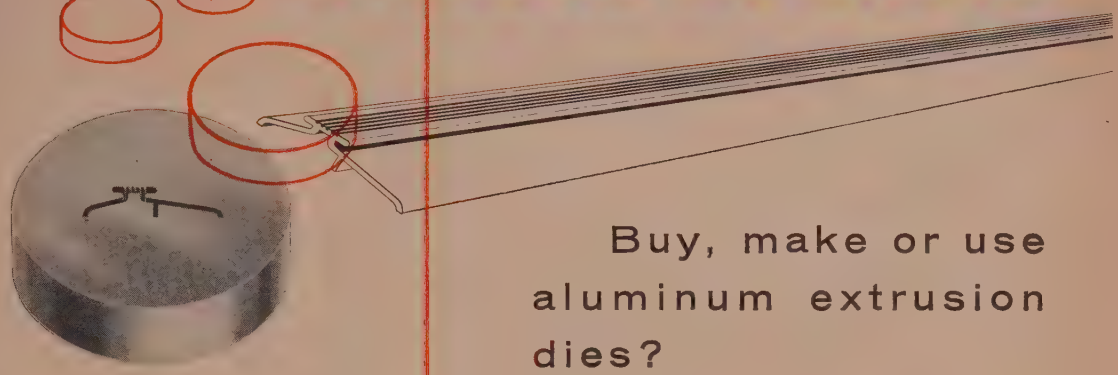

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BRANCH OFFICES and WAREHOUSES: BOSTON • BUFFALO • CHICAGO • CLEVELAND • DAYTON
DETROIT • GRAND RAPIDS • HARTFORD • LOS ANGELES
MIAMI • MILWAUKEE • NEW YORK • PHILADELPHIA
PITTSBURGH • TOLEDO • SAN LEANDRO • YOUNGSTOWN

Copyright 1959—Latrobe Steel Co.

Famous Charak line of furniture makes startling use of cast aluminum bases, other parts. Alcoa helped designer Donald Deskey select appropriate finishes; recommended polished finish with clear plastic-base lacquer.

the cost of the process appreciably. A year later they developed two new alloys of controlled composition that minimized production problems for enamelers.

A large variety of light-fast enamel coatings are now in a cost range that has greatly stimulated the use of porcelainized aluminum. Hundreds of thousands of pounds of aluminum per month are being porcelainized by a large number of enamelers.

When it comes to enameling aluminum castings, the solution is not so easy, due mainly to porosity in castings. Nevertheless, Alcoa is spending a lot of money to solve the problem because of the tremendous potential in such products as bath tubs and sinks.

"Research on porcelain enameling has cost us about $100,000 annually over the past five years," estimates Van Horn, "and we will spend more because we're so close to our goal of a really economical porcelain finish. We are working with many fabricators and we expect to see more porcelain enameled aluminum curtain walls, siding, and other products."

Finishing Advances

ARL is working on new and improved anodic finishes which will be more durable and more convenient and economical to apply. Several new methods of finishing are under development which appear to offer considerable promise. One of these provides a dark blue finish which has outstanding light-fastness.

The built-in anodized gray color is still the cheapest of the anodic coatings and costs less than colored enameling.

The per square foot cost of color anodizing aluminum is considerably higher than the cost of applying a new alkyd enamel that can be sprayed on. The latter will also last longer on aluminum than it will on steel. The reasons: Nicks or scratches result in progressive corrosion on steel and better adherence of paints is obtained on properly prepared aluminum.

ARL has come up with an aluminum pigmented organic finish — alkyd plus aluminum pigments — which employs a special type of aluminum powder. This non-leafing pigment results in a metallic lustre rather than the glossy surface. After baking, the coating should last up to 15 years.

They have produced the finish in all colors but red, and accelerated fading tests have proved that the coating is remarkably stable, making it a good finish for roofing and siding.

These are only examples of current projects. What lies immediately ahead is the most ambitious research and development program ever undertaken by a basic materials producer. Most activities have of necessity concerned the pressing problems of Alcoa and its major customers, but the transition to widespread consumer industry use of aluminum has changed Alcoa's research thinking.

New Research Center

Last year Alcoa acquired 2400 acres of land at Merwin, Pa., about 28 miles from Pittsburgh. Here, it will soon start building a giant research and development center which will cost upwards of $30 million.

"While research to solve immediate problems is a must," emphasizes Frank Magee, "this center will also give us a place to dream. We visualize Merwin as a technical center where other industries can send their designers and engineers to learn exactly what aluminum can do. We will have complete ingot casting, fabricating, forming, welding, and finishing equipment, that will operate on a pilot scale for almost any type of product. This way we can teach our customers everything that will help them produce better aluminum products at less cost."

Merwin will also train Alcoa men to better serve specific consuming industries. "We hope to have a campus-type atmosphere," says Magee, "with motels and restaurants where we can house scientists and engineers in order to acquaint them thoroughly with the solutions to problems."

Kent Van Horn thinks of this center as a place where Alcoa can cut the time element between today's needs and tomorrow's products. Research, if profitable, really leads to design for living, he believes, and this center could become a clearing house for inspired creative ideas of radical new development.

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Quaker State supplies the Aluminum you need when you need it

QSM is your most dependable source of quality Aluminum in sheets and coils, in mill, embossed, or anodized finishes. Gauges run from .008 to .067 inches thick. Alloys are 1100, 3003, 3004, 5005, and 5357 in all tempers. Widths from ½" to 48".

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QSM's complete modern rolling mill is always ready to meet your needs. Additional facilities for supplying Aluminum sheets and coils and other mill products include: annealing furnaces, shearing, slitting, leveling, forming, and embossing equipment.

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Quaker State's own experienced engineering staff is ready to help you develop, detail-design, and manufacture exactly what you need in Aluminum. You can depend on QSM for outstanding Aluminum products made to meet your requirements.

QSM is your fastest, most dependable source of quality Aluminum

So, the next time you order Aluminum, order it from Quaker State. There are 11 centrally located branch offices to cater to your needs.

QUAKER STATE METALS COMPANY - Division of HOWE SOUND COMPANY

Mill Producers of Aluminum Sheet—Coil—Tubing and Building Products

LANCASTER *Pace Setters in Aluminum* PENNSYLVANIA

throughout the industry.

"At Merwin we will get the customer's designer and our researchers closer together. If something productive evolves, we can then invite their engineers and production people in order to speed up a product from its inception through consumer acceptance," Van Horn projects.

As Frank Magee concludes, "This will be a tremendous thing for everyone — for the industry, for our customers, for ourselves."

Commercial Research

Acutely aware of the need for additional data to help decide whether a market was worth going after, Alcoa set up a task force seven years ago to make market studies for management. Started by Ralph Davies, this 25-man group, now known as the Commercial Research Division, has two sections— analytical and statistical.

The former conducts major marketing studies and quick evaluations, maintains product histories, and makes annual forecasts. The latter collects and analyzes all Alcoa sales figures, sales reports, etc. The Division is made up of people having at least five years of sales experience, with a number having sold for 10 to 12 years with Alcoa. It is also a good training ground for people to move up into management.

Commercial Research, headed by Ed Strauss, develops Alcoa's master marketing plan — collects statistics showing which products the company can make the most money on, points out what new facilities may be needed, identifies those products which offer best growth prospects, and programs how best to allocate sales time on them. These data then go to the product and industry managers so that they can plan for a better return on their efforts.

Data also go to the field sales manager in the most fertile areas so that he can determine what firms to concentrate on. With business getting more complicated, Alcoa considers this type of staff help essential.

If a certain market's potential is proven, it may justify establishing a manager for that industry. This would help the company increase its share of that specific market. If commercial research finds that a certain product has strong merit, it can put more force behind the development of that product.

Commercial Research also helps customers explore for new products or markets. The group may brief those companies' key men on an entire market, providing statistical data, plus an interpretation of market saturation, competitive situation, profits, etc. The client then goes to the sales development division where he can get a more complete, technical picture. Then the sales office goes to work to complete the sale.

A new, four-digit coding system used on all incoming orders is a refinement of the government's SIC coding system. It also breaks down specific industry groups that are combined — often hidden in the government's system. Under development is a process whereby weekly records will be kept of incoming orders and shipments by markets. The system will spot business changes within specific industries by the week, and at the same time analyze sales results of any industry group.

Another sales aid system that started several years ago is a semi-annual analysis of all consuming companies. Tabulated from salesmen's reports, it includes the name of the company, its location, number of employees, products made, total aluminum purchases, percentage sold by Alcoa, an estimate of the aluminum usage in the forthcoming year and Alcoa's share of same.

Information on some 12,000 of these firms is in Alcoa's files, making this a major aid in estimating future demand. Last year, for example, after adjusting for known deficiencies, commercial research came up with a figure that was only off slightly from actual demand.

These industry and customer data can be useful to salesmen. Inquiries can be sifted through the codes, and the information attached to the inquiry before it goes to the salesman. Thus, he has advance knowledge of a new prospect before knocking on the door.

As for new studies, where should the concentration be? Simetimes this can be ascertained by inquiries from Alcoa's advertising. One current project is the cargo container field. Another has to do with marine tankers, while still another is centered upon residential building products that have not been made in aluminum.

In its early years, Commercial Research made an annual post mortem on aluminum consumption by specific industries after total shipments had been compiled. It was a considerable undertaking at that time, due to the problem of incorporating marginal industries under ten broad headings. This job, with refinements, is still carried on. The statistical work has progressed to the point where Commercial Research now is projecting aluminum consumption by industry for years in advance.

■ ***Design, product development, and promotion are vital to larger sales. Alcoa is betting its corporate future on a creative, forward-looking approach, says vice president of sales development Fritz Close (right), shown here examining a "Forecast" ad layout with vice president of advertising Art Hall (left), and designer Sam Fahnestock, head of design section.***

Accent on Design

Design became a magic word several years ago when New York's Museum of Modern Art instituted its "Good Design" awards. Design in aluminum left much to be desired (still does, for the most part) as evidenced by Modern Metals' largely unsuccessful attempt a dozen years ago to ferret out some good designs in light metals.

But in this period, Alcoa created the nucleus of a design program through its "Imagineering in Aluminum" advertising and promotional program. Its aim was to help engineers become better acquainted with aluminum's economic advantages; to stimulate their imagination in designing products that would exploit these advantages in new ways. Other aluminum firms were also aware of the badly designed products on the market and were trying to remedy the condition.

Perhaps the attitude of the American

Dependable Background ...for Better Extrusion Dies

Extending the range and application of light alloy extrusions is one of the important services PMD has contributed to the light metals industry. Through the development of advanced tooling techniques, PMD has helped pioneer imaginative new concepts of product design—concepts which point the way to new cost savings by reducing or eliminating such production operations as assembling, fastening, joining, etc.

PMD's background of experience in designing and building extrusion dies is your assurance of improved product quality, increased output and lower costs. You can depend on PMD extrusion dies for maximum die life, minimum starting problems and consistent accuracy.

NEW! For extruding the space age metals — titanium and A286 stainless steel — as well as copper base alloys and steel alloys, PMD is now supplying precision cast dies in chromium and tungsten hot-work steels, tungsten and molybdenum high-speed steels, and cobalt alloys.

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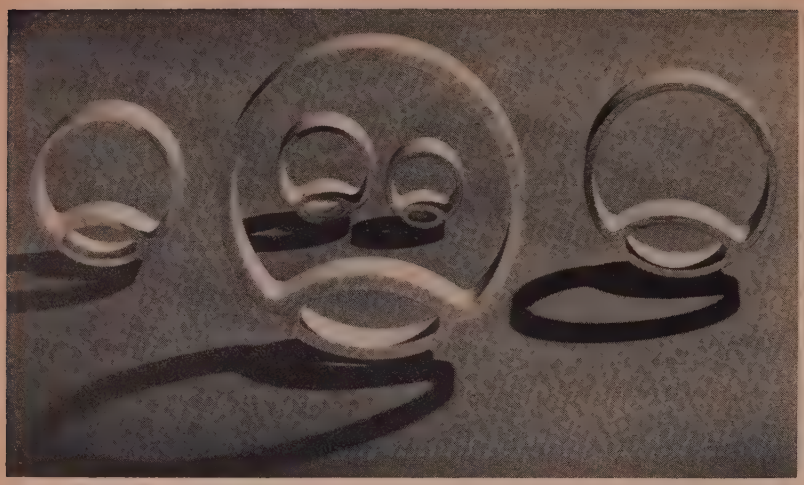

■ ***Unitrace, the integrally steam heated extruded aluminum pipe introduced by Alcoa in 1953, has been so successful that larger sizes have been added through the years. Now available in standard diameters up to 6 inches (Alcoa also supplies 8-inch Unitrace on special order), the pipe is ideal for transporting materials that require steam-traced piping.***

consumer was somewhat responsible, since he emerged after the war with money in his pocket and pent-up demands, and was willing to buy almost anything.

During and after the Korean War, architects, for example, were virtually forced to accept aluminum as the building field emerged as the number one aluminum user. At about the same time, other industries such as transportation started to get serious about replacing other materials with aluminum.

"Forecast" in Design

About three years ago, Alcoa began its now famous "Forecast" design series, the Sputnik which rocked industrial designers out of their aluminum lethargy. This continuing program, which commissions outstanding designers to come up with new and unusual designs for aluminum, brought Alcoa a flood of interest and acclaim which has been nothing short of sensational.

In a presentation at last year's International Design Conference, Frederick "Fritz" Close, vice president in charge of sales development and industry sales, said: "Alcoa's future is profoundly wedded to outstanding design. We know that Alcoa's being an active, healthy corporation 5, 10, 50 years from now depends on whether our product has achieved design acceptability."

In referring to the "Forecast" program, Close noted that his company is not trying to improve today's mode of living, but rather is looking for a vision of tomorrow's living as conceived by the best creative minds. "We are betting our corporate future on a creative, forward-looking approach."

When industrial designers—both consultants and customer staff members—started asking for aid in designing aluminum into new products, Alcoa found itself long on information, but short on effective ways to provide it. So four years ago the company set up within its sales department a design section headed by designer S. L. "Sam" Fahnestock.

The idea was to help the consulting industrial designer in *his* office, as opposed to initiating design and promoting it to a manufacturer from Alcoa offices.

Fahnestock reasons that it is impossible to help a manufacturer unless you know about his facilities, but that a lot can be accomplished by helping the outside designer decide on the proper fabricated part.

If the designer requires non-standard forms, Alcoa works with him to evolve a feasible fabricated component. It will supply samples of forms and finishes, joints, and other technical and design advice. If Alcoa's designers can work closely enough with outside designers, a considerable volume of sales will result when the products go into production.

Fahnestock knows and talks the designer's jargon. Since he has nothing to sell them but Alcoa's services, more and more of the 500-odd independent industrial designers are beating a path to his door. The "Forecast" program helps, because there isn't a designer living who wouldn't like to have his work shown in full color in the slick magazines.

Most designers approach Alcoa with one thought in mind: "Can I do this in aluminum?" How this translates into a "project" is well illustrated by the Walter Dorwin Teague effort for the Air Force Academy.

When Teague's designers started working on furniture for the Academy, they came to Alcoa for information. Teague's men were impressed by the finishes for extrusions and tube, but were concerned about how the finishes would look on welded joints.

Alcoa showed them how to work around the problem and made up six sets of samples. Later Alcoa was asked to inspect the prototypes. Eventually one large order went to a fabricator who bought all his tube from an Alcoa competitor. As a result of assistance from Alcoa, the fabricator ordered 30,000 pounds of tube for the job. He has since been a 100% Alcoa customer.

When Donald Deskey designed his famous Charak line of furniture (see p. 44), he asked Alcoa's design people for help on the cast structural frames, and on finishes for the castings and other parts. In this case the design had been frozen before Alcoa entered the picture, and welding was very much a part of the fabrication. Alcoa recommended a polished finish with a clear plastic base lacquer, a great improvement over the original concept.

Finally, there is a case history of Lawnlite's new Pompeian furniture line. Its designer, George Farkas, asked Alcoa to help find a fast way of getting the furniture into shape for badly needed pre-market catalog photos. The main question was whether the table base should be spun or cast. The latter was selected, and the drawings were taken to an Alcoa foundry where plastic molds were quickly made in time to finish the project.

This had been low cost furniture, but as a result of some suggested changes it led to a line of higher priced furniture—a species uncommon in this field. The new line has become much more popular, and Alcoa supplies the metal.

Alcoa's courting of designers has awakened other basic materials industries to the advantage of the new approach. In fact, the biggest of them all, U. S. Steel, recently unveiled a similar program.

For Future Designers

Alcoa recently came up with a plan to influence future designers by teaching them about aluminum before they have to use it. Directed toward industrial design students, it is the first such activity ever sponsored by a materials producer. It currently includes three specific activities:

1. Establishing an aluminum technical library in schools having an industrial design department.

2. Supplying aluminum free each

ADAM METAL SUPPLY

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SHEET - PLATE - ROD - BAR - PIPE - TUBING - WIRE - EXTRUSIONS - ETC.

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■ *Alcoa's three new executive vice presidents. From left to right: Lawrence Litchfield, Jr.; Leon E. Hickman; and M. M. Anderson. They will help expedite important policy decisions in all phases of aluminum. This is one step in Alcoa's effort to avoid bottlenecks in an increasingly competitive market.*

year for approved student projects.

3. Presenting seminars conducted by Alcoa men, showing new and experimental forms and finishes of aluminum.

Several additional activities are contemplated by Alcoa in its design school program. Among these are recognition beyond the activities already announced. The company expects to announce new phases of the program this fall.

In addition to stimulating awareness of aluminum among junior designers, Alcoa naturally seeks to establish the company in their minds as the leading producer and as the prime source of aluminum knowledge and quality products with which to work.

At the 1957 convention of the American Society of Industrial Designers a lively panel discussion centered around one controversial issue: Free design services supplied by basic materials companies. Some company designers were accused of competing with independent designers.

Alcoa's Fahnestock was not criticized because it was the consensus among designers that his company offers design aid but no design service. The subject became important enough to the designers to form a committee to work out a policy of common understanding for practices in design work.

Here's how M. M. Anderson explains Alcoa's design policy: "We will not compete with designers. We will aid the independent designer or the designer in manufacturing plants if we're invited. We believe they know more about the design of their own products than we do. Our object is to help them use aluminum more effectively."

On the other hand, Magee stresses a need for positive action in areas where current designs in aluminum are unsatisfactory. Where a potential Alcoa product might be evolved, its designers set to the task of developing such a product. Where the initiative is with the customer, Alco will concentrate its designers in a missionary effort to bring the "word" of aluminum to designers working on projects in such a field.

Whether right or wrong, Alcoa has placed new emphasis on design and has set aside immediate advancement and profit in favor of long range and sometimes altruistic goals. They appear to be building a deliberate foundation for market growth, with an unspoken but company-wide attitude of "We'll wait."

The Foreign Picture

With aluminum gaining status as an international metal, the U. S. producers are looking more and more to Europe, South America and Asia for new markets. The most widely publicized move in this direction was the British Aluminium Company's attempt to obtain the financial and corporate support of Alcoa in its long-range expansion program.

A combine made up of Tube Investments in England and Reynolds Metals Company in this country did succeed in gaining control of British Aluminium. Anderson succinctly sums up the acquisition in this fashion: "Reynolds wanted BA worse than we did."

Alcoa, however, is making good headway in other areas, notably Japan and Venezuela. Comments Frank Magee:

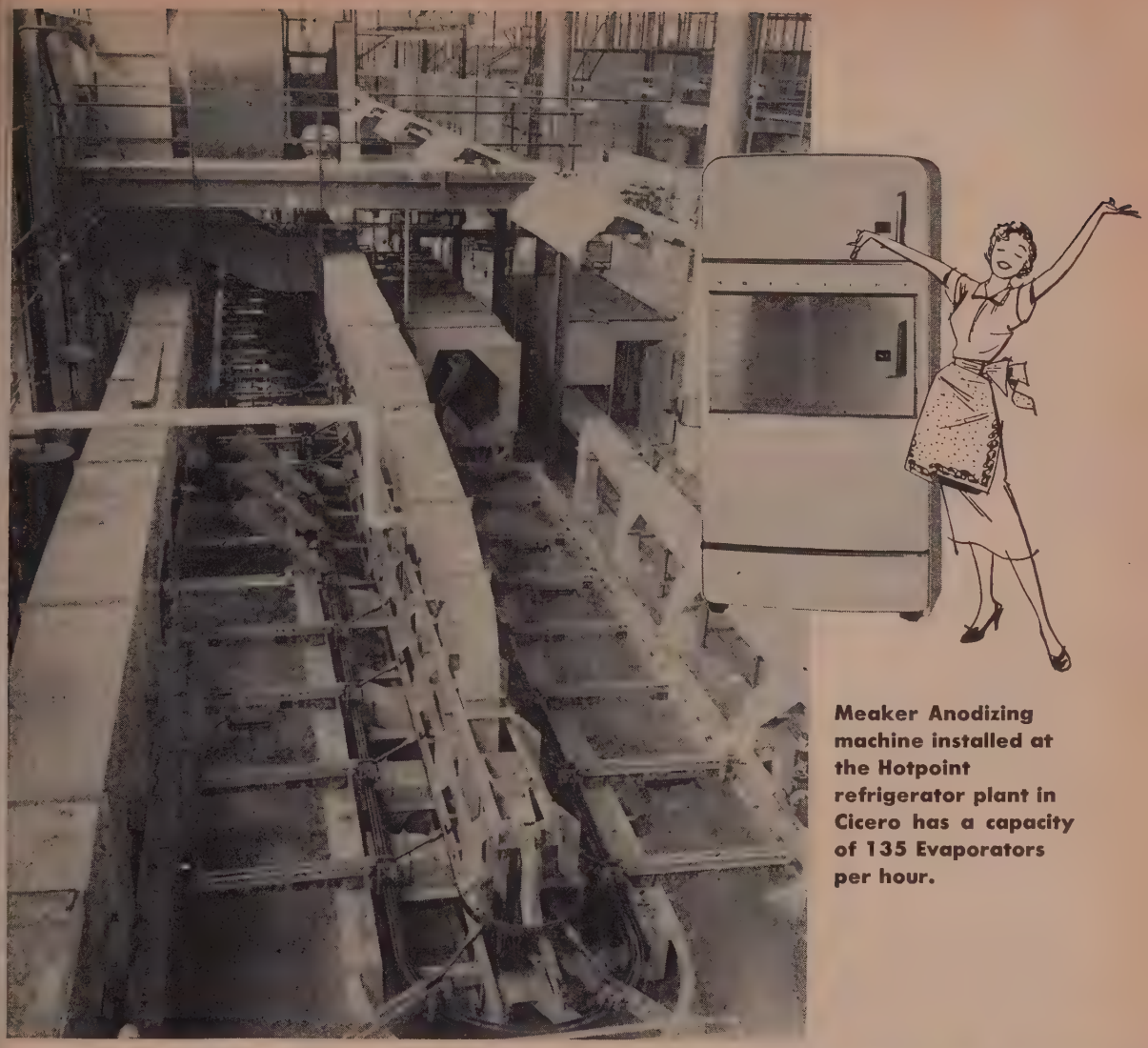
"Alcoa International, Inc. has been formed by our company to obtain an increasing share of the expanding world market for aluminum products. Our organization for achieving maximum foreign sales also is being strengthened. Furakawa Electric Co. of Japan approached Alcoa to establish the jointly owned company — Furakawa Aluminum Co. (Furalco). This firm will manufacture aluminum and big mill products in Japan for Far East markets."

Furakawa Electric, the leading aluminum fabricator in Japan, employs about 5500 people and has been primarily a producer of a limited number of aluminum mill products. Furakawa had approached Alcoa initially; was anxious to advance its production techniques.

According to John Mitchell, president of Alcoa International, "Alcoa's interest was whetted by the fact that the per capita consumption in Japan is less than two pounds, about 1/10th that of the U. S., and a large number of Japanese products made for the export market should contain much more aluminum than they do." What's more, Furakawa is a weighty name in electrical manufacture throughout the world.

In winding up with 33% of the new company, Alcoa will provide Furalco with machinery, equipment, patents, technical and administrative assistance for the fabrication of nonferrous metals in Japan. Thus, Alcoa has tuned itself on the Far East market, and teamed up with a substantial operating company in that area. Furalco's expected initial annual production will be approximately 12,500 tons of aluminum fabricated products.

Last year Alcoa started on a multi-



Meaker Anodizing machine installed at the Hotpoint refrigerator plant in Cicero has a capacity of 135 Evaporators per hour.

MEAKER helps HOTPOINT meet new trend toward lighter Anodized Metals

Engineered and designed as an integral part of Hotpoint's production line, **this Meaker Anodizing machine is used for the complete anodizing process.** It was expressly developed to handle various components and difficult to drain refrigerator parts such as deep, box-like "evaporators." Carrier arms in this case were engineered to raise to a 30° angle assuring complete pour-out of liquid and eliminating the carryover of fluids from one tank to another.

Meaker engineers think like plant engineers and it's this kind of detailed thinking that has helped Hotpoint solve many other plating problems and produce a finer end product at the lowest possible cost. On your next metal finishing problem, call Meaker—**this experienced company can show you tomorrow's ideas for plating and processing.**

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METAL FINISHING EQUIPMENT

The Meaker Company *1629 South 55th Avenue, Chicago 50, Illinois*

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DOW | MAGNESIUM

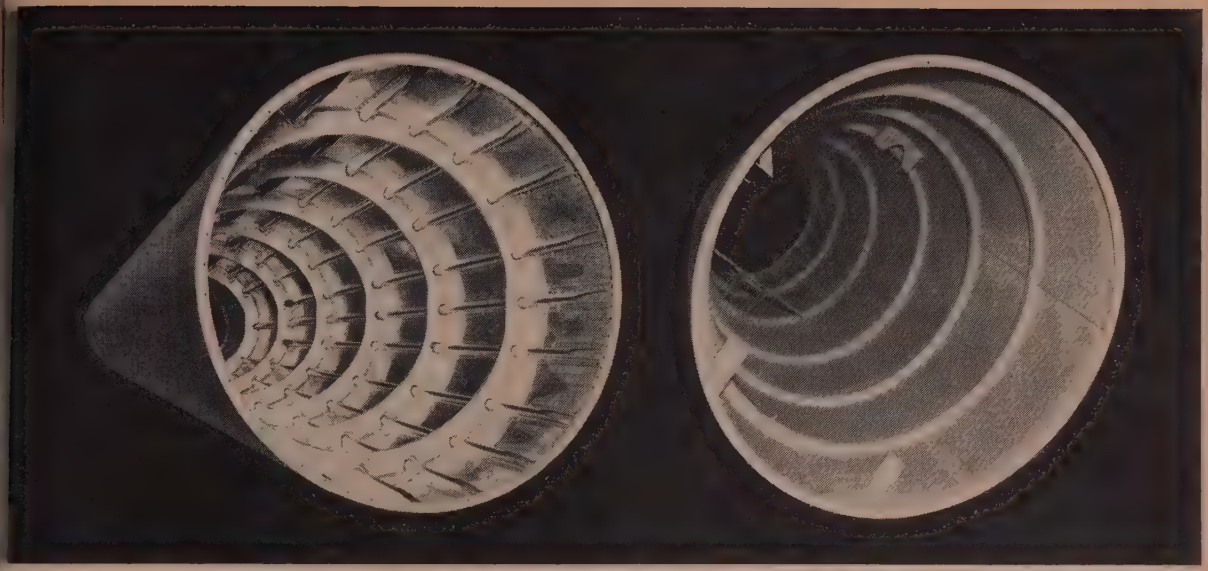
LIGHTWEIGHT DESIGNS

save more than weight

Designers reap a rich harvest of additional benefits as a result of lightness when they use magnesium. Bonuses such as more payload, simplified design, increased performance and reduced human exertion.

People who buy and use the luggage pictured above derive a very direct benefit from magnesium. As this lightweight luggage is made of magnesium, it saves human effort and fatigue. Also, the reduction of weight means more luggage can be carried without extra charge when traveling by air. Magnesium saves human exertion in other products, such as ladders, power tool housings and materials handling equipment.

Another example of the many savings and extra benefits that magnesium —and its resultant load lightening make possible for the designer is in the automotive field. One delivery truck unloads its last parcel and heads for the garage and the gas pump. Another, of identical size, goes on to deliver many



SIMPLIFIED DESIGN in magnesium aircraft part (right) was made possible by its advantageous stiffness-to-weight ratio.

nore lbs. of merchandise. Why? The econd truck is much lighter—its body s made entirely of magnesium alloy heet, plate and extrusions. *Because* he second truck is lightweight, it can carry more payload. Or, it can carry he same payload as the first with less uel, smaller tires and less wear and ear on the engine and transmission. Lighter trucks also save their owners noney on license fees, insurance preniums and over-all maintenance.

An even more dramatic example is hat of missile design. In one ballistic nissile, the elimination of *one pound* of excess weight contributes approximately 18,000 feet of additional altitude and a comparable increase in range! This means vastly improved performance wherever magnesium can be substituted for heavier materials.

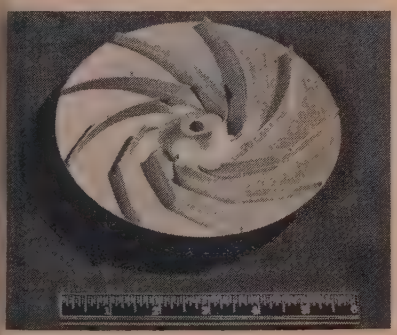
MAGNESIUM LIGHTNESS INCREASES STRENGTH, STIFFNESS

The designer who is seeking a stiff section can achieve it easily—and still save weight—with magnesium alloys. Magnesium weighs only 67% as much as aluminum, 25% as much as steel and zinc. A structure made of magnesium could be 8 times as stiff as the same part in steel if designed to equal weight. If equal stiffness is the design criterion, a magnesium section can weigh 62% less than steel and 25% less than aluminum.

Aircraft manufacturers have learned to exploit these facts to the fullest in conserving precious airborne weight. Critical parts such as wing and tail structures can be designed with more than adequate stiffness for high speed flying conditions. And, in addition to weight savings, magnesium helps provide a smooth aerodynamic surface and reduces "flutter" and "drag". Most important, the use of more rigid magnesium sections simplifies design by eliminating many of the stringers and stiffeners necessary with other materials.

★ ★ ★

WRITE TODAY for new brochure, "Magnesium Design". For your copy of this valuable reference for designers, contact the nearest Dow sales office or write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Magnesium Products Sales Department 1342 CQ6



22,000 r.p.m. HOUSEHOLD ITEM

This die cast vacuum cleaner fan must rotate at 22,000 r.p.m. and have low starting inertia as well as high centrifugal strength. Only magnesium was able to meet the requirements of this specific design. Casting tolerances are held so closely there is no need for balancing.

WORKER FATIGUE THWARTED

A prominent automotive manufacturer uses magnesium paint shields in spraying speedometer panels. The weight saving compared to previous shields resulted in less fatigue, higher efficiency for women employees. The excellent alkali resistance of magnesium permits easy removal of dried paint.

DOW PRODUCTION FACILITIES

The Dow Madison, Ill. mill rolls flat sheet and plate and coiled sheet. It also provides extrusions up to 30" circumscribing circle. The Dow Bay City plants produce high quality sand, permanent mold and die castings as well as lightweight magnesium fabricated assemblies. And, you get Dow experience and technical service in addition.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

million-dollar hydroelectric project in Suriname, South America. The Brokopondo Development involves construction of a dam, power house, cable lines to supply a 150,000 kw installed capacity. The government of Suriname has agreed to supply land, roads, sanitation, etc. Alcoa will build a 60,000 ton aluminum smelter near the power site and eventually will add a bauxite refinery. When completed, the whole project will cost about $150 million. The new operation will give the company plenty of raw metal with which to serve the foreign markets.

Another Alcoa project recently came to light when the company disclosed a new partnership in Venezuela with Montecatini, an Italian company with wide-ranging interests. This firm has been an aluminum producer (40,000 tons per year) for 30 years, and also produces lead, zinc, copper, chemicals, and power. The new firm, Corporacion Venezuela de Aluminio, will manufacture extrusions and tube in Venezuela largely for that country's markets.

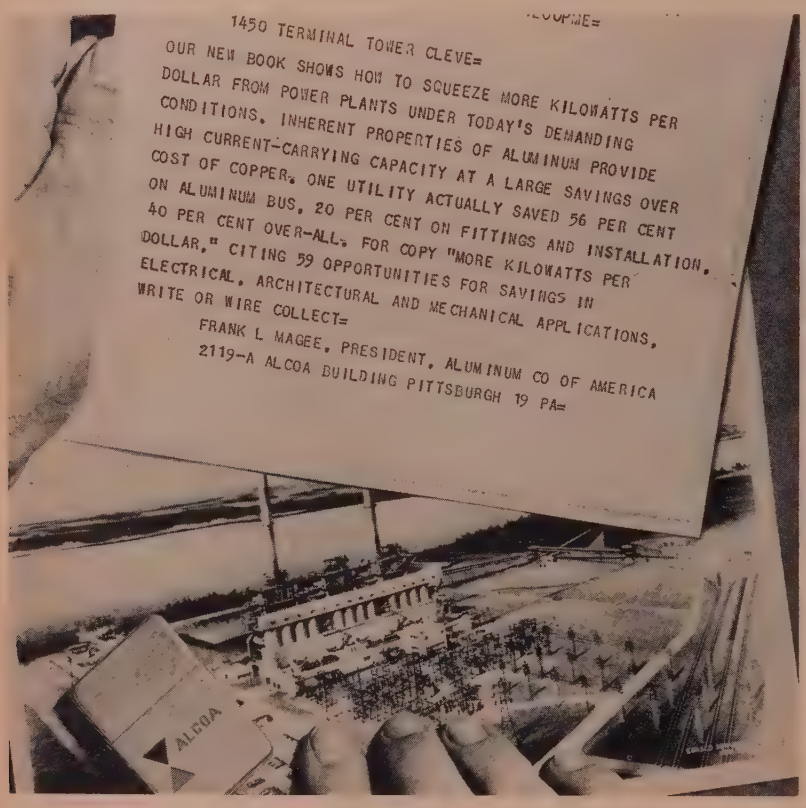
Alcoa will be primarily an investor in the operation, with its 30% interest matching that of Montecatini. The balance is coming from Venezuelan investors.

While the foregoing expansions are relatively new, Alcoa has had an operation in Mexico for the past 15 years. Its subsidiary, Alcomex, makes and sells extruded and tubular products, and plans are underway to expand this operation.

As for Europe, Frank Magee says, "The potentialities of the Common Market cannot be ignored. If this six-nation common trading area goes over as well as its backers expect, its aluminum consumption should increase substantially, and its low cost fabricated products will be a large factor in the world aluminum industry's expansion plans."

Some people think that the industry's rush to gain footholds in foreign countries has come about too suddenly. As Anderson puts it: "You start looking in a hurry when you have a lot of open capacity and can see imports gobbling up part of the markets you developed. No question about it; some of this activity is strictly defensive."

And there are those who disagree with using scarce money to expand abroad. "We've got enough to develop here without going abroad after outlets we know little about," remarked one. Asked to comment on this, Magee stated: "We think we can do both."


1450 TERMINAL TOWER CLEVE=
OUR NEW BOOK SHOWS HOW TO SQUEEZE MORE KILOWATTS PER
DOLLAR FROM POWER PLANTS UNDER TODAY'S DEMANDING
CONDITIONS. INHERENT PROPERTIES OF ALUMINUM PROVIDE
HIGH CURRENT-CARRYING CAPACITY AT A LARGE SAVINGS OVER
COST OF COPPER. ONE UTILITY ACTUALLY SAVED 56 PER CENT
ON ALUMINUM BUS, 20 PER CENT ON FITTINGS AND INSTALLATION,
40 PER CENT OVER-ALL. FOR COPY "MORE KILOWATTS PER
DOLLAR," CITING 59 OPPORTUNITIES FOR SAVINGS IN
ELECTRICAL, ARCHITECTURAL AND MECHANICAL APPLICATIONS,
WRITE OR WIRE COLLECT=
FRANK L MAGEE, PRESIDENT, ALUMINUM CO OF AMERICA
2119-A ALCOA BUILDING PITTSBURGH 19 PA=
ALCOA

■ ***The $10 million or more Alcoa will spend on advertising this year will pay for several programs in major media such as television, radio, consumer magazines, trade magazines, etc. Example shown here is one of the "telegram" ads that appear in the Wall Street Journal every Friday. The series has pulled high quality inquiries.***

Hot on Advertising

Ten years ago, Alcoa thought it was going all out with the $2½ million it was spending on advertising and promotion. (It *was* a large budget, considering the size of the company and its markets.) Since then, however, Alcoa has increased these outlays an average of 10% a year; will spend over $10 million on advertising and sales promotion in 1959.

Alcoa considers advertising a vital part of its business machinery, not just an accessory. It maintains a 35 man ad department in Pittsburgh and 18 promotion supervisors in district sales offices; doesn't cut back its advertising and promotion effort when business drops. In addition to its big consumer advertising, the company allots a large portion of its budget to help build a bond between Alcoa and its customers.

"We constantly try to inform our customers about the difference between Alcoa and our competitors," explains Art Hall, vice president in charge of public relations and advertising. "We render much greater service to our 15,000 customers than merely supplying aluminum, and we believe that these 'added values' should get us a bigger share of each customer's business.

"We have developed a long list of good reasons for doing business with Alcoa, and they form the basis of our long-range sales and advertising programs. For instance, our new 'Added Values' ad program portrays actual Alcoa people and their work in behalf of our customers. This human approach presents a true and favorable image of Alcoa to our customers and prospects."

One example: A full color ad shows Alcoa's research director, Kent Van Horn, and tells of research leadership, product and processing developments, inspection and quality control, sales promotions, and the Alcoa label. Other ads, featuring welding and joining engineers, curtain wall specialists, district sales personnel, and warehouse distributors will appear in leading industrial and trade magazines this year.

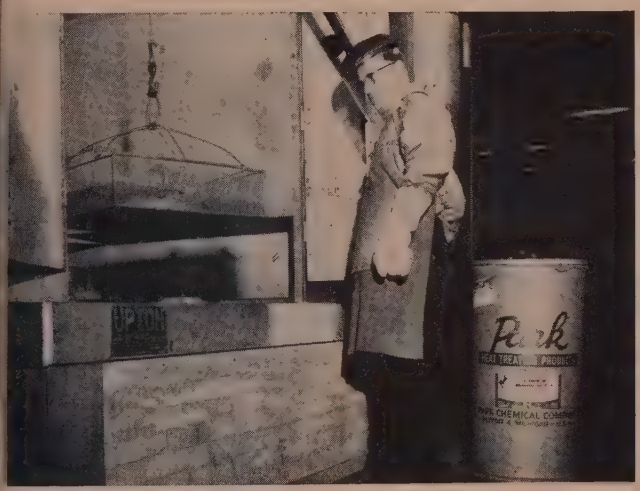
About 3½ years ago, Alcoa started a "customer support" program, boosting the products of four separate industries. The program now includes seven separate, but fully integrated promotions, covering all levels of distribution and each aimed at the point of sale during seasonal peaks.

"This does two things," Hall explains. "It expands our customers' markets and, in turn, ours too."

"What we've set out to do," advertising manager Tod Hunt points out, "is talk to our customers' customers, sell

From left to right, Mr. Karl Woerle, Foreman, Mr. Neil Paterson, Supervisor of Tools and Equipment, Mr. Robert Settles, Park Chemical Company Representative.

Hamilton Standard gets better results from Park Aluminum Brazing Salt



In many cases, dip brazing in salt baths is the most practical method of joining aluminum. Extremely thin gage aluminum can be handled without damage from pitting or distortion because of uniform heating, close temperature control and the buoyancy of the molten bath. Salt brazing is often the only way complicated assemblies such as heat exchangers can be brazed successfully.

Park Aluminum Brazing Salts are superior to other fluxes because of their better fluidity, greater stability, freedom from sludge and ease of cleaning. They act as both flux and heat transfer medium for all dip brazing operations on aluminum alloys. Joints can be made by using wire rings, flat shims or brazing sheet. Assemblies of various sizes and shapes can be brazed at the same time, saving time and labor.

Hamilton Standard's work includes a variety of aircraft parts requiring a high quality bond. It is important that an aluminum brazing salt be used that meets their high standards of quality. Park Aluminum Brazing Salt D has produced quality brazing efficiently and economically for Hamilton Standard. Separate additions of costly chlorides have been eliminated. Laboratory and maintenance control has been reduced to a minimum. The problem of desludging three times a week has been reduced to checking for sludge once a week. The stability and reliability of Park Aluminum Brazing Salt has been amply demonstrated.

For detailed information on Park Aluminum Brazing Salts and their applications, send for technical bulletins or contact your nearest Park representative.

Park

PARK CHEMICAL COMPANY • **8074 Military Avenue, Detroit 4, Michigan**

Table 4 — Seven Major Targets of Alcoa's 'Market Maker' Advertising Program

Market	No. of Customers	Products Advertised	Market Tonnage (millions of lbs)
Hardware	56	24	25
Cookware	61	3-areas	110
Boats, motors, accessories	63	3 majors	37
Sporting goods	116	80	6
Christmas gifts	300	200	156
Furniture & picnic accessories	97	15	40
Residential building	1000	25	850
TOTAL	1693	350	1224

them more products, with the purpose of increasing Alcoa's share of our customers' business. This is not institutional advertising; it is a hard and expensive sell to peddle more Alcoa aluminum at the customer plant level."

The "Market Maker"

This year Alcoa's "Market Maker" program is aimed at supporting seven major markets of its key customers who manufacture consumer durable goods. They are: hardware, boats, cookware, furniture, sporting goods, residential building products, and Christmas gifts. Table 4 shows what is involved in each market, by customers, products featured, and the potential for aluminum.

Conscious of the fact that the boat industry is a big market for aluminum, Alcoa is explaining to the gneral public the advantages of the metal over competing materials. It shows that aluminum is less expensive, easier to work, and stronger than fiberglas. The aim, of course, is to reverse a trend to fiberglas; to convince both manufacturers and buyers that aluminum boats look racier, are more seaworthy, and last longer.

In each Market Maker promotion, network television and radio play an important role of informing the general public of the attributes of aluminum products. In these media, Alcoa pushes its individual customer's products by name. Customers who have established distribution outlets are allocated television commercial time on an equitable basis commensurate with their purchases of Alcoa aluminum. Smaller customers with regional distribution are supported by local and regional radio and spot TV commercials.

In addition to the consumer push, every Market Maker promotion includes trade advertising to inform the customers' dealers and distributors of the products involved and the promotion itself; Alcoa even supplies large quantities of point-of-sale material for the dealers and distributors to use at the point of purchase.

Alcoa industrial advertising is broken down into 45 trade and technical programs. "Here," Hunt states, "the major purpose is to promote our own industrial products to approximately 15 different industry groups, but 'customer support' is also carried on in these programs by the use of case history type advertising."

Alcoa uses all major media in its total advertising efforts, including television, radio, consumer and trade magazines, business magazines, newspapers, outdoor posters, and spectacular signs, and direct mail. In addition, it produces several major motion pictures a year and stages over 250 different trade and technical exhibits and displays. The advertising department operates its own production department for the coordination and purchase of literature and booklets.

Why Television?

During the last several years, television outlays have formed a sizeable part of the company's ad budget. Why network TV? Alcoa has three major reasons:

1. To familiarize the public with Alcoa's corporate image — it does this by linking the company's developments with subjects of high public interest, such as missiles, rockets, airplanes and automobiles.

2. To support customers' products; 50% of the commercials deal with customers' products.

3. To sell its own products, such as Alcoa Wrap household foil, building products, closures, farm roofing and gates.

Company management is convinced that TV offers the lowest cost-per-thousand of any of the major mass sight media. Alcoa presently sponsors two evening programs; the Emmy award winning "Alcoa Theatre," and the dramatically different type drama, "Alcoa Presents." Total audience is 47 million people per month.

Alcoa men are quick to point out that radio advertising is the lowest cost-per-thousand of all standard advertising media, and that Alcoa is using a multitude of spot commercials in local, regional and national radio. They like the good mileage of spots — an average of $11 each on a customer tie-in basis throughout the country.

Radio and TV advertising reaches a broad audience, but Tod Hunt believes that printed media are the best for actual inquiry pulling power. In some cases, Alcoa is able to determine the specific response of its trade advertising and direct mail. For example, when it stepped up its advertising of farm gates, sales increased in direct ratio to the amount spent.

The job of sorting and channeling the 150,000 inquiries Alcoa gets in a year's time keeps six girls busy throughout the year and helps keep 500 salesmen digging for places to sell Alcoa's huge aluminum capacity and its many products.

Among the company's more novel advertising approaches, Alcoa recently joined Chrysler (cars) and Kimberly (knitwear) in a "fashion on the move" program. Each firm designed a two-page ad featuring the products of all three and ran as a six-page feature in *Vogue*. The theme was also promoted by 38 Chrysler dealers, in trade and newspaper ads, in window and interior displays in 38 major department stores (including Bergdorf-Goodman and I. Magnin), and on Alcoa's television shows.

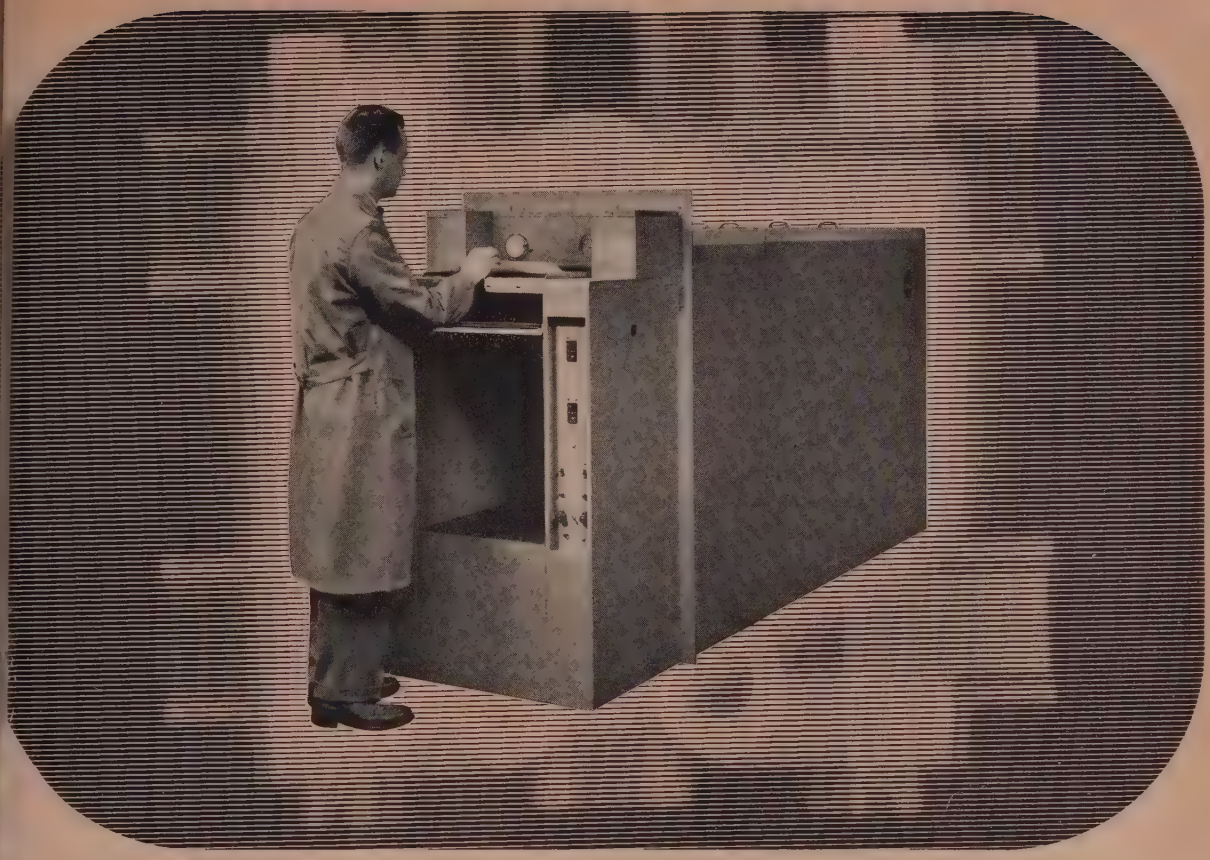
"This type of promotion isn't easy to sell, and it's expensive," Hall admits, "but it has helped gain good acceptance of aluminum trim in automobiles by the general public. We hope to initiate more of them as the opportunities develop."

Still another pitch for direct response is a series of "telegram" ads which appear almost every Friday in the *Wall Street Journal*. Each ad features a single product, tells of its advantages and costs, and exhorts the reader to "wire us collect" for more information. The ad is signed by president Frank Magee.

"We've had some very interesting, high quality inquiries," Tod Hunt says, "and only a few have come in collect. We've also received many letters, with excellent prospects for orders. Frank Magee sees the inquiries as they come in and takes a personal interest in the replies."

"Forecast" Program

Two years ago, Alcoa began what promises to be one of its most productive promotions. Called "Forecast," it boldly pushes the idea that "There's a World of Aluminum in the Wonderful World of Tomorrow." The plan combines the work of leading designers an-



13-minute industrial x-ray film processing

New Kodak Industrial X-Omat Processor can save you time and money

Kodak offers you automation in film processing—radiographs of uniform high quality, dry and ready to read in 13 minutes.

Film hangers are eliminated. Exposed films are merely removed from the film exposure holders and fed directly into the processor. Kodak Industrial X-ray Film, Type AA and Type M—sheet films or continuous lengths from 70mm to 17 inches wide—go through the system at 38 inches per minute. *And* only 22 inches of the unit's 10-foot 10-inch length need extend into the darkroom itself.

The Kodak X-Omat Processing System saves time and cuts costs. You'll want the complete story.

Send for the folder that gives all the details.

X-ray Division—EASTMAN KODAK COMPANY—Rochester 4, N.Y.

Use this coupon NOW for more information

EASTMAN KODAK COMPANY, X-ray Division, Rochester 4, N. Y.

☐ Send the folder about the Kodak Industrial X-Omat Processor.

☐ Send the names of the Kodak Industrial X-Omat Processor dealers in my area.

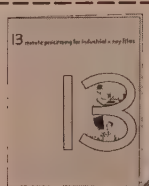
237-6

Name_____

Firm Name_____

Firm Address (Street)_____

(City)_____ (State)_____



Kodak
TRADE MARK

outstanding photographers to depict aluminum's future application for the home of tomorrow. Another objective: to prove to the most skeptical eye that aluminum's naural beauty and utility can contribute to superior product design.

The designer is encouraged to suggest what he would like to try in aluminum, the idea being that the strongest motivation will produce the most original results. Alcoa stresses the point that it wants to promote a concept, not necessarily a product.

"Forecast" has put "dream thinking" on a practical level; could even result in significant contributions to our way of life. Aluminum users learn more about creative design; designers learn more about aluminum; and the public learns more about Alcoa's role as the prime developer of aluminum.

The dozen "Forecast" features that have appeared in the mass circulation and business magazines have spotlighted some notable case histories. The first design was a ball gown, a woven aluminum job. Result: Aluminum yarn is now widely used in bathing suits, cocktail dresses, etc. Price of the yarn has dropped from $17 to $6 per yard. Then came an aluminum yarn rug which led to the adoption of an aluminum line by several carpet makers. The famous Paul McCobb "Forecast" chair is now in production, as is a shelved room-divider designed by Alexander Girard.

Other designs which have stirred up interest among manufacturers include the Noguchi hexagonal table, Don Wallace's porcelain enameled tableware, a wall mosaic by Ilonka Karasz, and David Aaron's playground fixture. Featured in *Life* Magazine was a revolving summer beach house and a Kaleidoscreen space divider. A Harley Earl design featured new concepts in aluminum packaging designs. As a result, the former GM stylist now has about ten other similar design products underway for various firms.

Other "Forecast" designers have been besieged by manufacturers to explore new ideas for them. Thus, these designers have not only been influenced toward aluminum but the program also stimulates designers everywhere.. Alcoa is continually receiving new ideas for possible inclusion in "Forecast."

"This program is alerting many individual designers and their clients to the fact that so many new things are happening in aluminum today that entire new markets are being opened up for us," enthuses Magee. "We now have a department to work with designers and clients. We think this approach has started a new relationship between the product designer and a basic material supplier like Alcoa."

Alcoa's 18 advertising field promotion managers throughout the country keep customers, dealers, and Alcoa's own salesmen updated on the manifold advertising and sales promotion projects. The field men alert customers to forthcoming programs, supply reprints, assist in direct mail programs, provide mats for newspaper ads, and work with distributors and dealers on point of purchase counter displays, signs, etc., at the local level.

"It's pretty hard to lose a customer when he sees you are out to help him sell more of his products on a continuing basis," says Art Hall. "This type of saturation promotion also helps our sales engineers in working with prospects on new and different products."

In 1955, Alcoa came up with its now well-known label. The idea had been kicked around for years and finally the policy group appointed a committee to invent one. Alcoa uses it extensively on its products and in its advertising; and also offers it to customers to use on their products and in their promotions.

Support the Customer

The label serves two functions: To identify Alcoa products; and to tell the consumer that the label is "their guide to the best in aluminum value." The label has been used around 15 billion times.

While some skeptics questioned the value of the label 3½ years ago, Alcoa can prove that it is the fastest growing label in America today. Over 1500 customers have signed a labeling agreement and use it on their products.

In a recent survey, eight out of ten people recognized the Alcoa label. Its influence on consumer purchases is five times greater than it was three years ago. Some retailers count so heavily on its help that entire orders have been returned to manufacturers because the label was omitted.

How does Alcoa justify the millions spent on advertising and promotion? "We must and will continue to promote our own industrial and consumer products," explains Art Hall, "but one of our major objectives is to support the products made by our customers. The leader of an industry has the responsibility for the year-round support of its customers. We will sustain this activity because it will help maintain our leadership and give us a big advantage over our competitors, whether in aluminum or other materials. By having the strongest program of any metal manufacturer, aimed to our customers' customer, we are dedicated to raising the absolute demand for aluminum and sharing proportionately in the growth of the market."

This Olympian program is packing a factory-to-family wallop that is having a magnetic affect on the retention and acquisition of customers. It is also an Alcoa wedge against price cutting.

Sales: The Changing Emphasis

Back in 1919, when Frank Magee was a salesman in New England, auto body shops in his area were over-ordering to such an extent that Alcoa had to allocate. Most firms were still pretty skittish about aluminum, however, and engineers shied away from new materials.

"Our sales strategy was one of picking away at any market that looked even a little bit promising," Magee recalls. "Cooking utensils and the auto industry were major outlets."

But the early 20's brought a substan-

■ ***Latest, and one of the most promising aluminum highway products, is Alcoa's new guard rail. It is competitive in cost with rails made of other materials.***

"The more outlets we can acquire," ys vice president and sales manager alph Davies, "the more we can acquaint eople with aluminum. We may wind up ith 3000 establishments that will stock lcoa aluminum — from warehouse dis- ibutors, lumber dealers, and hardware utlets to glass distributors."

al slump in demand for most materials, nd Alcoa's business slid with it.

"It awakened us to the fact that our ales techniques had to change. Gone ere the days of simply producing etal, getting an order, and then doing e fabrication. We had to find cus- omers who could use the metal all on eir own.

"It was in this period that we started ssigning all products by classification product sales chiefs, and these men n turn reported to the man in charge f all product sales, and hence on hrough to the sales manager."

Magee went on to explain that the roduct sales group grew over the years nd this has been the basic pattern of ales ever since. But during the late 0's and the depression, management ecame aware that too many of its re- earch and development projects were ot being fully utilized by the sales orce.

"To bridge this gap, we set up a ales development division which now as well over a hundred technical men. hese people are on call by district sales anagers for assistance on design, fabri- ating, finishing, and so on for Alcoa ustomers."

In the early 50's, Alcoa decided that he sales development engineers were preading themselves too thin. About his time company policy began to use he "rifle" rather than the "shotgun" approach. Coordination of product sales through industry managers, backed up by the sales development group, became the order of the day.

"For example," Magee illustrates, "we have had electrical industry specialists for years, but we depended on the salesman to make the first contacts. We are now working to strengthen this effort with specialists who are intimately familiar with problems of the electrical industry. Thus any new prospect will be channeled into the electrical industry group where an industry manager is better qualified to advise the salesman."

This transition to industry sales managers for supporting the advertising and outside selling effort is essential, according to sales vice president Ralph V. Davies.

Industry Managers

"When you triple production and sales, as we have done during the past decade, and when you are making a multitude of new products, a fundamental change in sales philosophy is inevitable. We had 9400 customers in 1950; today we have about 15,000. Obviously, this 50% increase takes us into areas where the entire sales problem is different."

Davies went on to explain that the industry sales group was primarily an outgrowth of and aid to the sales development division, and that the transition would be gradual until complete.

"The salesman and engineer must work closer together," Davies continued. "Our industry sales managers fundamentally furnish new ideas and stimulate salesmen to dig up new outlets."

The product manager, as before, will be the watchdog over product quality, costs, service, and capacities, and the liaison between production and the industry manager. Since he is no longer fully responsible for contacts with the district sales managers, he can more effectively channel his efforts into the important coordinative area.

Here's an example. In servicing the 600-odd firms in the air conditioning industry, Alcoa sells at least 15 separate mill products for some 50 to 75 applications. Alcoa reasons that in order to keep track of all applications and all prospects, it is best to have an industry manager who is just as familiar with all climate control products and manufacturers as he is with aluminum.

"In this way," Davies confides, "we can also compile a reasonable estimate of how much aluminum each industry is using; we can project tonnages for new uses within each group; and we can determine what share of this market Alcoa is getting and take steps to improve our position.

"And finally," he adds, "if our research people and development division, in coordination with the product manager, come up with a new or suggested product, it can be referred directly to the specific industry group, thereby speeding up the process of getting it to the type of Alcoa customer who can best handle or make it."

Alcoa now has managers for the following industry groups: Aircraft and Missiles; Automotive, Passenger; Automotive, Commercial; Architectural; Residential; Mobile Homes; Highway Products; Electrical; Rigid Containers; and Military. Others are under consideration.

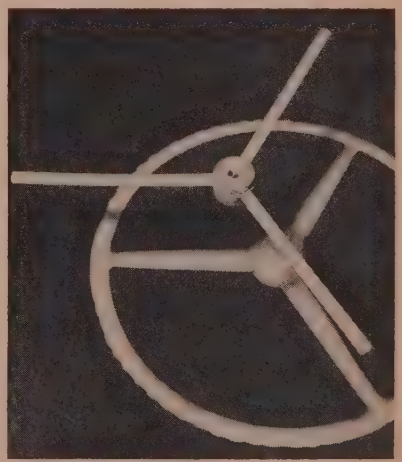
The problem, of course, is where to stop. In the meanwhile, however, other fields not covered directly by an industry manager continue to be handled by the Sales Development Division.

When asked how soon Alcoa would establish the remaining industry groups, executive vice president, M. M. Anderson, commented:

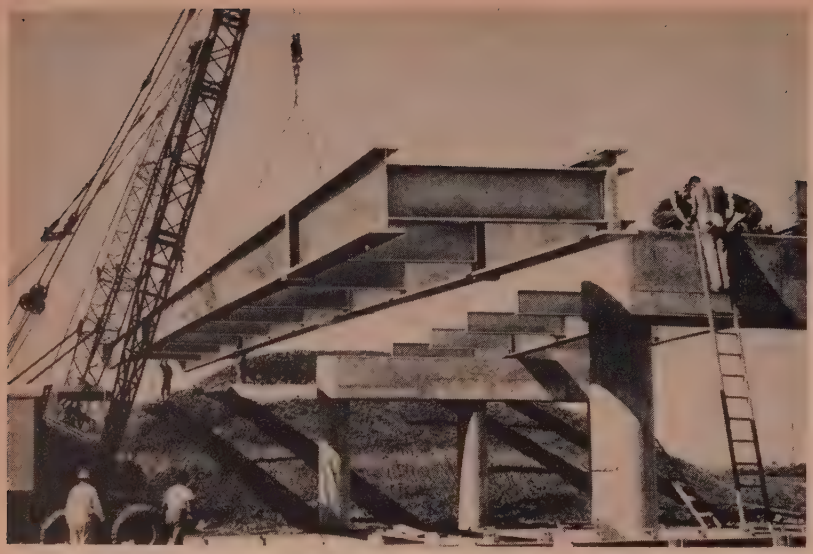
"We're proceeding slowly in order to pick the right industries and then the right men for such responsible positions. We must select men with the proper type of personality and experience and, at the same time, not weaken the existing sales organization."

This brings into focus a problem faced by many basic material producers: How to find experts with knowledge of specific consuming industries as well as their own company's products.

In its report on Alcoa, the American Institute of Management stated: "The company should not be opposed to outside hiring when it seems advisable



■ *Lateral impact extrusion is Alcoa's new process which adds the possibility of metal flow outward from the direction of the press stroke, in addition to conventional forward and reverse flow. Shown against the automobile steering wheel which it resembles is a prototype lateral impact which was produced with one press stroke. Process combines forging and extrusion to produce intricate parts with close tolerance forged strength.*



■ ***Alcoa's market research revealed that the federal highway program would involve construction of up to 300,000 bridges of all types — an enormous market for aluminum to shoot at. Alcoa joined forces with other primary producers to design aluminum bridges that would be competitive with other materials. One result is this span, shown under construction for the Iowa Highway Commission.***

. . . " What with growing business complexity and keener competition, Alcoa is becoming less opposed.

"Out of our 62 sales offices, we have 500 salesmen calling on thousands of firms every day and coming up with ambitious new uses and prospects," notes Robert B. McKee, vice president in charge of sales offices and direct selling. "This new industry setup will allow us to expedite those items which have an immediate and good market potential. In this way we can more effectively control a salesman's efforts, and, can get him answers much more quickly than ever before."

It has been noted that Alcoa has been unable at times to exploit the many ideas that emerged from its research and development activities. Consequently, as one Alcoa man puts it, "There were plenty of times we found the gourmets feeding on a carcass we'd just shot."

Highway Program

Evidence that Alcoa intends to put a stop to this commercial "larceny" was demonstrated several years ago when the $10 billion highway program was first announced. The company had been working on several aluminum highway products, and quickly recognized that this program offered ripe possibilities for aluminum highway signs, railings, lighting standards, chain link fence, bridges, guard railings, and signal systems. The logical approach was the industry sales set-up because the potential tonnage warranted concentrated effort.

Alcoa is now mass producing a highway bridge rail made of 4 - 5 inch aluminum tube, which is now specified in 44 states. The company's latest highway product is a guard rail which is competitive in cost with existing railings of other materials. Its low maintenance feature is an added advantage because it will never require painting.

Such progress is the result of a well coordinated effort on the part of the industry manager, product managers, development division, and research working through the sales offices.

Big as the highway market is, the rest of the building and construction industry is far and away aluminum's largest outlet. It is certain to consume much more than its present half million tons, but, as Magee puts it, "our problem is to find the proper ratio between product development money and sales pay-back.

"The building field is the biggest market for another 800 major firms, and the only market for perhaps an additional 6000 firms. The massive sales pressure by all of us will explode new uses at a tremendous rate during the next few years."

Over 800 firms are producing at least two dozen products for the residential building alone, and this one field is consuming upwards of 250,000 tons.

"This sounds like a booming, prospering outlet for aluminum," he says, "but that's deceptive. Too many firms entered the business too quickly with unproven products. The result has been over-production and price cutting in some product areas."

Nevertheless, the building industry is by far aluminum's largest market, and is likely to remain so for the foreseeable future. Many developments that originated on Alcoa drafting boards have contributed mightily to the startling growth of this market.

For example, when Alcoa introduced aluminum curtain walls several years ago — and dramatized the new product in the world-famous Alcoa Building — company management viewed this as a potential volume market. Today, curtain wall construction consumes upwards of 40 million pounds of aluminum annually — and the market continues to grow.

Rain Carrying Equipment

"Another example is our new line of rain carrying equipment," explains Fritz Close. "This includes gutters, downspouts, and accessories, which have good aesthetic appeal. They are also easy to install and service. In order to get better acceptance of such established products as roofing, siding, fence panels, garage doors, and the like, we also came out with a bake-on enameled Alumalure sheet in a wide variety of colors which is available in either flat or coiled form."

But Close admits that more remains to be done in the residential roofing field. More variety is needed, so Alcoa has put its designers to work on new textures, and greater contrasts. Alcoa people feel this is an untapped, promising market if some off-beat idea can be developed.

Aware of the fact that aluminum siding consumes almost 100 million pounds of aluminum a year, and that National Homes has proved consumer acceptance of aluminum as a residential building material, Alcoa is designing new types, patterns, textures and colors for this market. Alcoa is also developing a really wide building panel for homes which can change the potential of this market.

Concentration by industry sometimes brings to light areas where aluminum is losing out to other materials, or stands a chance of coming back. For instance, the commercial transportation group took a look at the railway industry and found some positive markets such as piggy back or cargo containers.

But an even bigger potential in this industry may prove to be aluminum for track-side buildings, which are spread throughout the country and are usually in poor repair.

Fritz Close looks upon these sheds — almost any wooden structure, in fact — as a prime market for aluminum. A good remodeling job on a sound structure can make almost any building look like new, and with the new products that have been developed and are being marketed by Alcoa — roofing, siding, rain carrying equipment, etc. —

sound lightweight castings

Whether your requirements call for simple shapes or intricate components, Light Alloys magnesium and aluminum castings will meet the most stringent specifications. On any job, large or small, you can be sure of the soundness and strength of the castings, smooth and practically free of porosity.

Design help and application advice on light metal castings are a part of our personalized service, as is efficient follow-through on your enquiry and prompt delivery of precision castings at lowest cost.

The original engravings for this advertisement were made on magnesium

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the life of such buildings can be extended for many years. Furthermore, the owner can charge the cost to maintenance and repair.

The mobile home industry is another example. A few years ago many of the 400-odd manufacturers were using aluminum exteriors. But as competition heightened, some firms began switching to steel or plywood. When it became apparent that this market was being lost by default, Alcoa and others started coming up with more rigid, more economical siding. Now, Alcoa foresees a major comeback for aluminum in mobile homes.

Packaging Zooming

But one of aluminum's brightest growth markets is the packaging field, and Alcoa is gearing up to push it for all it's worth. The company has stepped up its promotional and research activities in this field and has appointed an industry manager for packaging.

"The main reason," says Fritz Close, "is our estimate that packaging sales will double during the next five years. This year the industry is a cinch to wind up 15% ahead of last year."

Packaging consumed 55,000 tons of aluminum six years go. The total will top 110,000 tons this year, and over 200,000 tons by 1963. Alcoa men feel that new developments can boost their packaging sales by as much as a third within a year.

Example: The recent million-dollar expansion program at Alcoa's closure plant to produce a new screw-on cap for a Heinz baby food. This cap is expected to capture a large percentage of the 2 billion caps used on baby food bottles annually.

Alcoa has been in the aluminum closure business 45 years. It believes this baby food cap and other closures under test could double Alcoa's closure sales in the near future.

A few years ago, Alcoa went into a 50-50 partnership with Ekco Products Co. to set up Ekco-Alcoa Containers, Inc.

"Using our manufacturing techniques and their distribution outlets, we built an integrated foil operation with complete facilities for making rigid foil containers," relates Davies. "These people are outstanding merchandisers in the bakery field, and they have good outlets. This has proved to be a satisfactory arangement and promises to be a profitable one."

Concerning the entire area of finished products, Magee admits that "throughout our entire history we have gone into end products only when we felt it was necessary to develop or establish a market. Whenever we did make such a move, we did it reluctantly because we have preferred not to compete with our mill product customers.

"In recent years, however, increasing competition has forced us to take another look at our position in a number of fields. From where we sit now, it appears that our competitors will force us to take remedial action in some areas in order to insure Alcoa's proper participation in or retention of valuable segments of expanding markets."

For the past 30 years, Alcoa has had some of the best and biggest mill distributors — 21 distributors with 66 warehouses, plus another 700 specialty firms and jobbers, all of whom have a combined total of about 3500 salesmen. But the company sees an even bigger role shaping up for the distributor. Last year, for instance, Alcoa's distributors sold approximately 30% more aluminum mill products than ever before. They have increased their total by at least 1% a year.

As distributors become better equipped to do minor fabricating, including the installation of bigger press brakes and more roller leveler, and slitting equipment, they will sell more sheet products such as the new baked enamel sheet. Alcoa also expects them to get much further into the distribution of aluminum building materials.

■ ***With its complete new line of aluminum rain carrying equipment for residential use, Alcoa hopes to capture a large share of this market, long dominated by galvanized steel.***

"We have more tools to offer distributors than other materials producers," says Bob McKee. "Our goal eventually is to move as large a percentage of our aluminum mill products as possible through distributors."

A couple of years ago, Alcoa started considering lumber yards as possible new outlets for some building products. The company engaged the manager of a lumber dealers' association who made a year's study and found that the market was extensive.

Alcoa now has about 70 outlets selling rain carrying equipment, nails, fasteners, siding, specialty sheet, and the like. The company has made it more enticing by including lumber dealers in its label program and sales promotions at the local level.

"The more outlets we can acquire," says Magee, "the more we can acquaint people with aluminum. It is not inconceivable that some day we'll wind up with 2500 to 3000 establishments that will stock Alcoa aluminum around the country."

What's Ahead

Last month, Alcoa stock was added to the 28 representative industry stocks that make up the Dow-Jones Industrial Average. Alcoa replaced National Steel, and is the first aluminum company to join this select group. This action by Dow-Jones reflects the tremendous activity of all the aluminum stocks on the Exchange. It also puts aluminum into the most widely quoted business barometer.

Stock brokers have long considered Alcoa a blue chip stock. At the end of World War II, Alcoa stockholders numbered less than 8000; today some 25,000 persons own 21 million shares and were paid $27 million in dividends last year. During this same period equity per share of common tripled to $30.

Alcoa's common shares jumped from a low of $11 in 1948 to a high of $133 in '56; are currently firm and active at around $95 a share, paying $1.20 in dividends.

Like most growth stocks, dividends have been low in relation to the value of their equity on the "Big Board." Brokers still regard Alcoa a growth stock. So does Magee, who confidently looks forward to the day when Alcoa will be earning about $150 million after taxes. Considering that best year net (1956) was $90 million, this is an ambitious goal. It reflects the bullishness of Alcoa men who, even though going through a rough earning period like the present one, take a look around and say, "You ain't seen nothin' yet."

Alcoa and Copper

Meanwhile, they've got more than one game-winning ace up their corporate sleeves. For example, metal industry observers were more than mildly surprised last January when Alcoa revealed its plans to acquire Rome Cable Corp., a medium-sized manufacturer of insulated copper wire and cable. Was Alcoa actually thinking of "doubling in brass?"

"Why not," retorts Frank Magee. "If the copper companies can get into the aluminum business, why can't we in-

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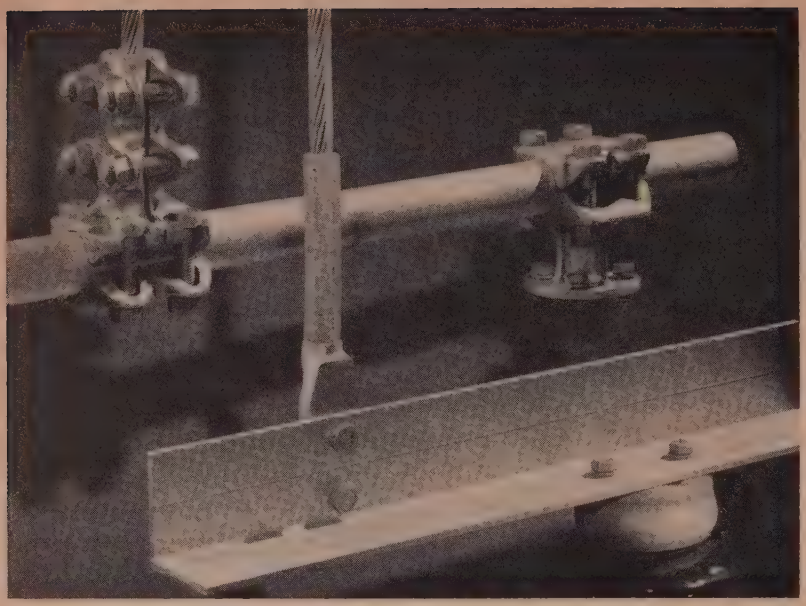


■ *Simplified installation of Alcoa's new Universal Angle Bus Conductor is illustrated in this photo contrasting UABC with the tubular bus it is designed to replace in many applications. Note simplicity of new system's cable clamp (left) and mounting clamp (right) compared with conventional installation.*

vade the copper business? There's a great future for aluminum in the electrical field, but copper will never be pushed completely out of the picture. With this acquisition, we not only strengthen our position in merchandising a well-rounded product line in the electrical field, but also gain a foothold in that part of the business that seems likely to remain the exclusive domain of the red metal."

In the words of executive vice president Leon Hickman, "We're pleased with the acquisition of Rome Cable because of the calibre of its management, its fine personnel, excellent facilities, technical know-how, the quality of its products, and its splendid reputation in the electrical field."

Alcoa acquired Rome Cable in March, making a wholly-owned subsidiary of a 23-year-old firm with 2500 share holders, 1500 employees, and plants in Rome, N. Y., Torrance, Calif., and Collegeville, Pa. The purchase cost 355,226 shares of Alcoa common stock, or roughly $32 million. Rome share holders received three shares of Alcoa for each five shares of Rome.

4th Biggest Market: Electrical

Alcoa's enthusiastic interest in the electrical industry is well founded. Electrical products will consume upwards of 200,000 tons of aluminum this year, making it aluminum's fourth largest market, and the potential seems almost limitless. Consider conduit, for example. This market consumes 600 million pounds of steel annually. Still other applications include electrical rotors and transformer windings.

"Many more electrical products should be made of aluminum for both economic and performance reasons," declares Magee. "Our philosophy will continue to be the conversion of copper uses to aluminum, recognizing certain limitations, of course. We have no desire to push aluminum where it is not suited."

Despite its interest in the electrical field, Alcoa, with its all-aluminum line, was falling behind its major competitors who have been acquiring plants and broadening their knowledge of the market. So was Rome Cable, which had not taken on aluminum to the same extent as its copper competitors. Its management undoubtedly recognized the need for a more complete line of both aluminum and copper products.

The purchase of Rome Cable, therefore, enables Alcoa to challenge its multi-metal competitors who had presented a real problem at the jobber and distributor levels. Alcoa also hopes to gain new aluminum outlets among electric utilities, electrical manufacturers, wire fabricators, industrial users, wholesalers, mines, and oil companies, as a result of Rome Cable's copper sales experience in these fields.

"We've done a lot of development on the insulating problem and electrical connections," explains Magee. "We are now in a much better position to convert copper uses to aluminum in this area than we were 10 years ago."

Alcoa is marketing or developing a number of other electrical products. A power transformer, taller than a one story building, is made entirely of aluminum except for the core and truck. Radiation is accomplished by new extruded aluminum finned tubes. While acceptance may be slow, advantages such as more efficient heat exchange, increased corrosion resistance, and lower manufacturing costs will permit ultimate acceptance, management feels.

Alcoa has also developed a network transformer case which replaces the usual transformer radiator tubes and eliminates welds and leakage. The firm also developed an experimental distribution transformer of all-aluminum construction, except for the core and insulation — the first to employ aluminum strip conductors instead of conventional wire winding.

Utilities are interested in Alcoa's new aluminum transmission towers because of potential savings in erection and maintenance costs. These same factors apply to more attractive enclosures for electrical substations which have been introduced by Alcoa for use in residential areas.

Several other electrical products are nearing completion. Alcoa claims to have a new aluminum magnet wire for motors, solenoids, and generators. Chief advantage: It costs less than copper. Another development is an Alcoa universal-angle bus conductor which will adapt to normal cable lug connections in distribution substations.

Alcoa is also working on aluminum strip winding for electrical coils. Here the potential saving is up to 50% in material cost, plus reduced fabricating expense. This is a big market; some 475 million pounds of copper are consumed annually for coil windings.

Autos: Big for Castings

Alcoa's second biggest customer, the automotive passenger car industry, is chewing up about 350 million pounds of aluminum a year. This market has injected a new concept into the aluminum industry: The "hot metal" arrangement, in which molten primary aluminum is sold at a discount to an automotive manufacturer whose plant is located near the smelter.

While Alcoa currently supplies a sizable portion of the aluminum for the industry, the hot metal approach can well be the determining factor in whether its percentage of the business will increase or decrease during the next few years.

Hot metal sales may well increase the amount of aluminum consumed, and the auto makers will produce a substantial portion of their own castings. For Alcoa, the only aluminum produced making automotive castings, this new

opment presents obvious hazards. omotive companies can handily out 200 pounds of aluminum cast- er car. In a five million car year, ndustry could consume half a mil- ons of aluminum castings annually more than present total castings of the 3000 aluminum foundries ie casters. Using aluminum's base this involves about a quarter of on dollars a year.

if auto makers were to do all this g work themselves, they would approximately 100 million square f additional casting floor area. It unlikely that they will embark such a program in the forseeable , since it would involve putting any eggs in one basket.

the hot metal approach proves , it can be expected that more contracts will be made. To auto s this means that metal can be t at a price lower than pig or and remelting is eliminated. aluminum supplier reaps advan- too. While he may not make as money per pound, probably he up for this on added volume. s more, he has a long-term con- customer who pays cash on the

industry as a whole could ben- so. One of the basic reasons for ot metal agreements was the auto s' desire to mass produce castings ver cost. "If they succeed," says resident Lewis P. Favorite, "they nquestionably step up research on aluminum products for cars. this market could narrow the gap between aluminum capacity onsumption."

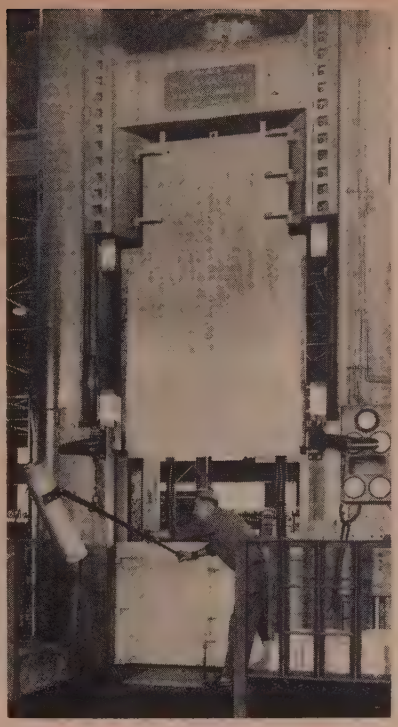
Metal Deal Next?

oa does not yet have any hot metal cts. If the approach is successful, er, and other automotive firms rced in for competitive reasons, mpany may have to seek such an gement.

of June 10th, rumors are flying effect that Alcoa is trying to ate a hot metal deal with a major irm. Alcoa neither confirms nor this. If such a deal goes through probably involve putting a part new 150,000-ton Warrick (Ind.) r in operation. Thus, Alcoa's out- ould be increased considerably than expected.

ether there's such a contract in ind or not, Alcoa's foundry people they will sell increasing amounts minum to the automotive indus-

ur foundries produce castings that econd to none," boasts Favorite. often get the tough job that no



■ ***Larger, more intricate, and more precise impact extrusions are being produced on this new 2500-ton vertical hydraulic press recently installed in Alcoa's Cressona (Pa.) plant. The company can now make impacts up to 12 inches in diameter and 60 inches long. Part shown in production is a prototype missile shell, 8¼ inches in diameter by 34 inches long and with ½-inch side walls.***

one else cares to tackle. Our foundry people have always earned the respect of castings buyers, and their advanced techniques will pull in more orders as the requirements continue to get more complex."

Moreover, castings aren't the only thing to sell to the auto industry, he reasons. "We now have an industry manager in this field, and we're selling increasing quantities of sheet and extrusions which we expect to be used in substantially greater quantity in the 1960 models."

"This light car field is our apple," Magee adds, "because our industry had the opportunity to be in on it during initial planning stages. They had to design and engineer with lightness in mind, and aluminum is the answer to this and related problems."

The Can: Which Direction?

Alcoa has been slow in getting into the huge aluminum can market. If aluminum could replace tinplate, this one application would consume considerably more aluminum than present world capacity. This prospect seems remote at present, but there are those in the container industry who concede that aluminum could grab a sizable chunk of the market within a decade.

As sales to this industry continue to grow, Alcoa is keeping an eye on the several plants that have installed aluminum can-making equipment and is working closely with can makers.

The can has raised a number of questions among people in the industry. Could this become another "hot metal" proposition, with food manufacturers installing their own casting, rolling and can-making equipment? Or would it be more economical to come up with a low-cost method to roll narrow coil and sell it to can makers and/or food manufacturers? Or should a company go into the can making business itself? Alcoa hopes not, and apparently intends to work the problems out with the can manufacturers.

According to Favorite, who is in charge of product sales, aluminum cans will only be adopted "where the inherent properties of the metal offer economically justifiable performance advantages."

He considers the aluminum beer can and certain food cans promising because they would result in longer shelf life than tinplate cans. He says Alcoa is also learning a lot from the aluminum aerosol can which in a few years has captured 28% of the market; admits that at the present time "Alcoa is shipping a considerable tonnage of aluminum for the manufacture of oil cans."

Begin With the End?

One very promising application that has gone practically unnoticed is the can "end." Due to the comparatively large amount of scrap generated in making can ends, Alcoa believes aluminum could replace tinplate and be competitive at the same time. In aluminum the scrap can be continuously remelted at practically low cost. In steel, it is sold as scrap. That is where aluminum makes up for its higher initial cost.

"This is one area where aluminum has an edge over tinplate," declares Favorite, "and we will gain experience here that will be valuable in our approach to the complete can. We're well aware of the fact that in order to get aluminum used for cans in a major way, we must come up with the lowest possible price on sheet. Alcoa is now in high gear looking for methods of producing aluminum sheet that would make it more competitive with steel for can manufacture."

"Aluminum has many advantages for cans," explains Magee. "It is available in thin gauges, it is light, ductile, and so forth. But what really gives us an

■ ***The development of the Flavor-Lok closure for baby foods was one of Alcoa's most significant R & D accomplishments last year. Success of the development bagged an initial order for 100 million closures; should bring in many similar orders from other food firms. The cap can be removed and replaced with a twist of the wrist, insuring protection of the contents.***

edge is the fact that it is extremely difficult to put styling into a tinplate container.

"With aluminum, on the other hand, the possibilities are tremendous. It has 'sex appeal' for the food industry. Many consumer items purchased in a can are bought on impulse. If the most attractive can will move quickest off the retail shelf, then advance styling is a potent wedge for us in this can market."

The Growth Pattern

When one questions Alcoa men on the biggest factors which brought about the tremendous growth in aluminum usage, the most common response is the construction of the Alcoa Building. Since its erection in 1950, it has attracted world-wide attention.

"Aluminum really became another material for the building field after we put up our own skyscraper and invited architects and engineers in to see what could be done with this metal," comments Magee. "We knew that in order to gain a foothold in building, we had to change people's minds about aluminum, and this building was a major force in showing what could be done."

While the Alcoa Building has played a leading role in boosting aluminum's acceptance as a building material, an event of similar magnitude occurred late last year when National Homes, biggest prefabricated home builder in the world, announced its new aluminum-clad homes. The success of this prefabricated structure is leading Alcoa into other channels. For example, the company has built a prototype gas station for Pure Oil on an experimental basis.

During completion of the huge highway program, thousands of gas stations will be built. If a standard aluminum structure can be made competitive, Alcoa men reason that this would be a substantial market to exploit. The same goes for restaurants and motels.

What goes inside these buildings is another big potential. For example, there is the multi-billion dollar plumbing industry, which has not been invaded by a new material in half a century. Alcoa is designing and testing cast sinks, and related parts, and is working closely with several plumbing manufacturers.

After Plumbing Goods

The plumbing industry offers a tremendous potential for aluminum foundry products which can be cast to closer tolerances and finished with less machining than cast iron. Also, their much lower weight results in considerable savings in freight. If the new porcelain enameling process works on cast products, a breakthrough into this big market is almost inevitable.

"The ever-advancing art of finishing is one of the biggest factors in the progress of aluminum," says Ralph Davies. "There was little or no alu num trim on automobiles seven or e years ago. As color became more portant in design, there has been a increase in the per-unit use of alu num in appliances, building produ and consumer durable goods, as wel most transportation equipment. C has become the important thing!"

"Despite all these advances," cauti Magee, "we must realize that alumin doesn't do everything. Where neces and advantageous, we must comb aluminum with other materials so it will play its best role at all times."

No More Shortages

The Alcoa organization has incr ingly geared itself to the growing c petition with other materials. But coa is now looking to the time whe will sell a million tons of aluminu year.

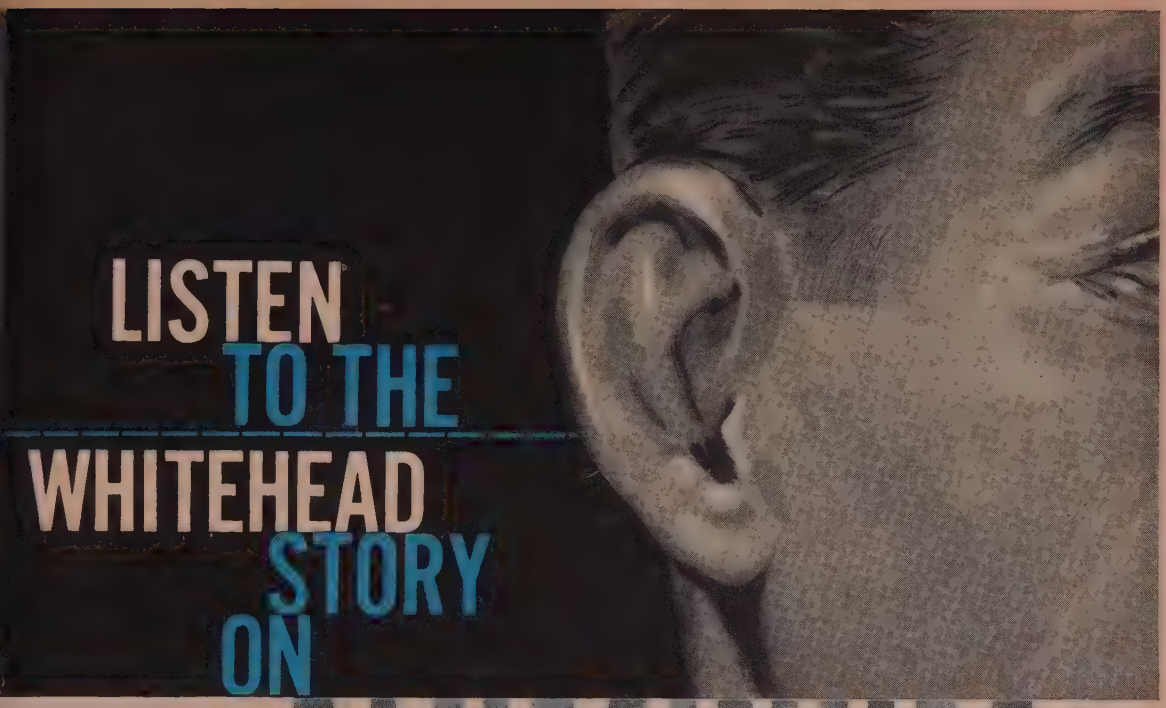
During its 70 years as a produ most of this time without competit Alcoa has played the role of a suppl However, the company has gradu altered its role in recent years. It aggressively moved to promote worthwhile product of any good tomer. And it has recognized its sponsibility to move into undevelo areas.

"There is so much to build on," gee points out. "This excess capa throughout the industry is someth we haven't experienced lately. Estim of long range demand for alumin have always been promising, and are more sure than ever that these mates are accurate; perhaps conse tive. As demand regains its growth the current excess capacity will minish.

"At long last we have gotten selves out of a semi-continuing sh age, and we aim to keep it that But until demand catches up with ply, we realize that any quick move add marginal and short term sales not benefit either us or the indus We must first lay a solid foundation a future breakthrough."

The Boss: Magee

As president and chief executive cer of the world's largest aluminum ducer, Magee intends to retain Alc "open door" policy throughout all le of its 45,000 employees. He feels management's decisions are more re ily accepted if employees and man ment are on "speaking terms." He believes that this policy spurs new i at all levels and allows for free exp sion of these ideas. Magee goes 10 for the management training prog



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ALCOA'S FRANK MAGEE

Forty-two years ago, a young electrical engineer named Frank Magee joined Alcoa as an apprentice in the Research Laboratories at $60 a month. (Today the average starting salary is about $500.)

"At that time," Magee recalls, "Alcoa hired mostly technical fellows, and they were all put in one technical training course. Later they were steered into either sales or operations."

Magee first became interested in aluminum through one of his college professors who was an Alcoa consultant. He suggested that Magee write directly to then-president Arthur Vining Davis. Magee sent Davis a letter of application. He figured his chances were slim; thought he was flunking metallurgy.

But he got his degree; was hired; and rose from salesman to district sales manager, to general production manager, to vice-president of production, to member of the board, and to executive vice-president. Two years ago he was elected president during a time when aluminum markets were receding.

Magee's varied experience throughout the departments and management levels of the company during Alcoa's formative years had given him the necessary skills and overall perception to meet the crises head-on. Three months ago he was named Alcoa's chief executive officer.

Magee is cautiously optimistic about the business outlook; believes that the current recovery should continue, "though a mild setback in the third quarter is a possibility." The only dark cloud he sees on the horizon is the return of tight money, "which might slow down the recovery unless credit loosens up."

Asked about Alcoa's plans to increase aluminum output, Magee notes that "we may be able to reach 90% of capacity, but it would take six months to get our new Warrick smelter in full operation."

Every Friday evening, business permitting, Magee escapes to his 200-acre cattle farm, 50 miles east of Pittsburgh, "where I can take my shoes off and stick my feet into some dirt. It's a fine place to grow grass, raise Herefords, and recharge my batteries."

But even at his weekend hideaway, Magee continues to play the missionary role he assumed years ago as a salesman. His cattle barns have gleaming new aluminum roofs — a reminder to his neighbors that there is only one *right* way to reroof a barn.

developed under M. M. Anderson.

"This helps insure better manage ment material — our greatest asset," h explains.

Magee does not feel that he shoul be protected by a "smoke screen." H is a completely candid person who ha a keen interest in any employee's prob lem, whether individual or company Associates say he has a mind of his own is stubborn about his convictions unti someone shows him facts to prove other wise.

Magee is "aluminum-smart"; h a worked in aluminum from productio to sales to management; knows Alco inside out — from its early years to it now changing role. As a former sales man, he never stops looking for new sales tools. He believes there are mor new uses to explore than ever before becomes impatient when he finds one being neglected.

He exemplifies the personality of Al coa and its place in modern busines He has always believed that aluminum is the very best material put on earth and he is devoted to moving it in greater volume to the ultimate con sumer. As one new Alcoa slogan goes "Alcoa helps you design it, make it, sel it." And to Alcoa's customers, Fran Magee adds: "Grow with us."

The Top Dog

Everybody in the industry has a opinion about Alcoa. There are thos who criticize Alcoa, mainly because it is so ruggedly aggressive in getting bus ness at times. There are also those wh have nothing to offer but praise an admiration for the big company.

Modern Metals last month surveye several hundred major aluminum fab ricators and end users, and the mor than 15% response put Alcoa we ahead of all competitors, affirming th fact that this aggressive policy is no going unnoticed.

Whether cussed or praised, the fa remains that Alcoa started the alum num industry and has remained on to of it for 70 years.

Though it may have been too pate nal during its early years, it believe that the job of more research and de velopment is primarily its baby. In th past, Alcoa offered its knowledge to it competitors. Now, with exceptional rugged competition, its efforts will b concentrated on projects that will he Alcoa and its 15,000 customers.

Alcoa is the big organization. It h made a great economic contributio that has filtered into the life blood some 25,000 firms making up the al minum-fabricator and end-user indust today. It can become bigger than th Duponts, Bethlehems, G.E.'s, or eve the Fords in the '60's.

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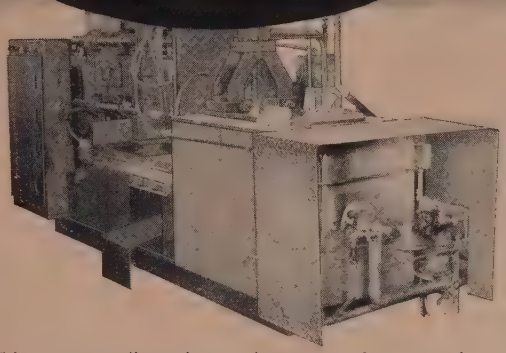

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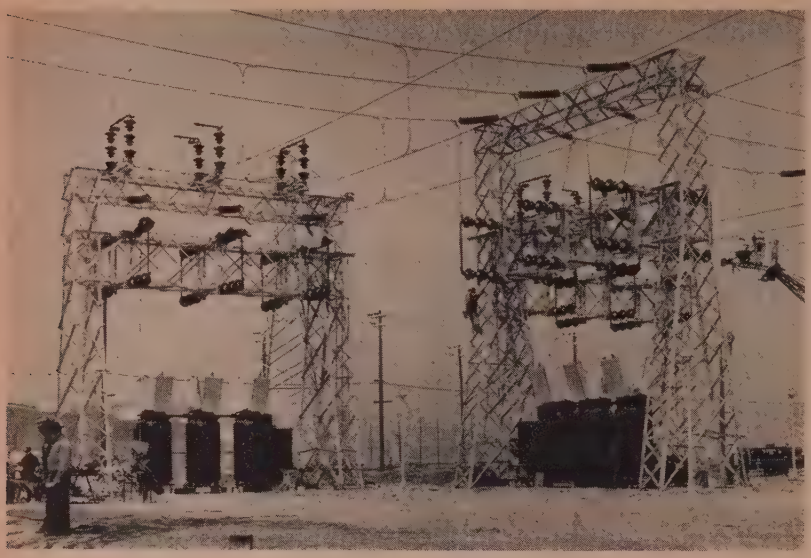


Coast Power Company Builds All-Aluminum Substation

A new all-aluminum substation being placed in service at Richmond, Calif., by Pacific Gas & Electric Co. is expected to reduce maintenance in the highly corrosive, salt water atmosphere of the San Francisco Bay area.

PG&E erected the substation for a 110 KV system at the Richmond refinery of Standard Oil Co. of California. The substation's nine towers are made of aluminum alloy 6061-T6 extrusions and vary in height from 36 feet, 6 inches to 43 feet, 9 inches. No maintenance painting of the substation will be required, according to Kaiser Aluminum & Chemical Corp., who supplied the extrusions.

Cross arms of the towers are made of two extruded 8-in. channels, laced together. Towers and crossarms were bolted together on site and then lifted onto foundations by cranes. Bolts are aluminum alloy 2024-T4, anodized, and nuts are 6061-T6.

The angle and channel extrusions were made at Kaiser's Halethorpe, Md., and Dolton, Ill., plants, then shipped to Kaiser's Permanente, Calif., plant for fabrication. The heaviest extrusion was a 33-ft. long angle weighing 145 pounds.

The complete substation required 27,000 pounds of aluminum; the light weight of the components simplified erection. The light standards shown in the photo are also aluminum.

Predict Bright Future For Soldered Aluminum

A zinc soldering process for joining aluminum to itself or other metals is expected to broaden the light metal's use in the refrigeration, automotive, air conditioning, and electrical industries.

Tests by Aluminum Co. of America, Alcoa Building, Pittsburgh 19, indicate the zinc technique offers the best method of making sound, corrosion resistant soldered joints. The basic technique is not new, but Alcoa research engineers believe it has never been fully appreciated because the process cannot be completely successful unless proper procedures, solders, and fluxes are used.

When employed with specially developed Alcoa joining products, they add, the zinc soldering process is especially suited to bonding thin complex sections, including heat exchangers. Other promising applications include metallurgical bonding of aluminum spiral or plate fins to aluminum, copper or steel tube, and bonding socketed tube joints and dissimilar metal transition joints.

Zinc soldered socketed tube joints exposed to extremely corrosive atmospheres for up to a year showed little or no corrosion damage. Tensile, hydrostatic, and fatigue tests on aluminum soldered to copper tube showed the joints to be stronger than those made by other processes. Aluminum-to-aluminum socketed tube joints displayed greater strength than the tube itself.

Alcoa engineers also cited advantages of the process over brazing. Soldering fluxes are less expensive and simpler to remove after soldering. Zinc soldering also permits the joining of aluminum to copper because it can be used at a lower operating temperature than brazing.

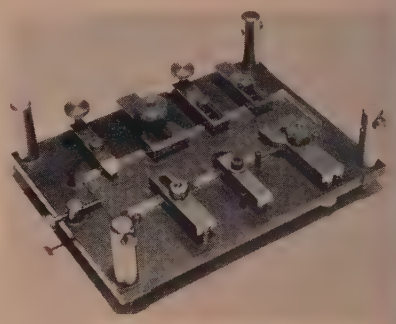
Alcoa supplies a complete line of materials for soldering aluminum to itself or to other metals. The company advises the use of Alcoa No. 81 or 82 soldering sheet, No. 805 solder, and No. 66A or 67 flux. Only the flux need be used in making some assemblies where one of the components is aluminum.

Plant Expansion Planned By Anaconda Aluminum

Some 25,000 square feet of operating space are to be added to the Terre Haute, Ind. plant of Anaconda Aluminum Co., the firm has announced. The space will be used for additional cold rolling facilities and equipment to balance manufacturing operations.

Lucius H. Bassett, works manager, said the addition would increase capacity substantially and improve operating efficiency when completed in about a year. The expansion plans were recently approved by the firm's board of directors and a building contract is expected to be awarded shortly.

The Terre Haute plant, which is not yet in full operation, manufactures aluminum sheet, plate, extruded shapes, rod, bar and tube. Anoconda Aluminum is a wholly-owned subsidiary of the Anaconda Co. The firm produces its own primary aluminum at its 60,000-ton reduction plant at Columbia Falls, Mont. Last year it acquired Cochran Foil Co. in order to further diversify its aluminum activities.



Precision Ground Jig and Fixture Plates

A complete line of stock precision ground jig fixture plates is being made by PIC Design Corp., subsidiary of Benrus Watch Co., Inc., at 477 Atlantic Ave., East Rockaway, N. Y. The firm is producing the plates in stainless steel or aluminum in thickness of 3/16, ¼, ⅜, and ½ inch.

All surfaces are flat and parallel to within .0005, with an overall 32 micro inch ground finish. Three shapes — square, round and rectangular — in a variety of outline dimensions, are readily adaptable to all jig and fixture applications.

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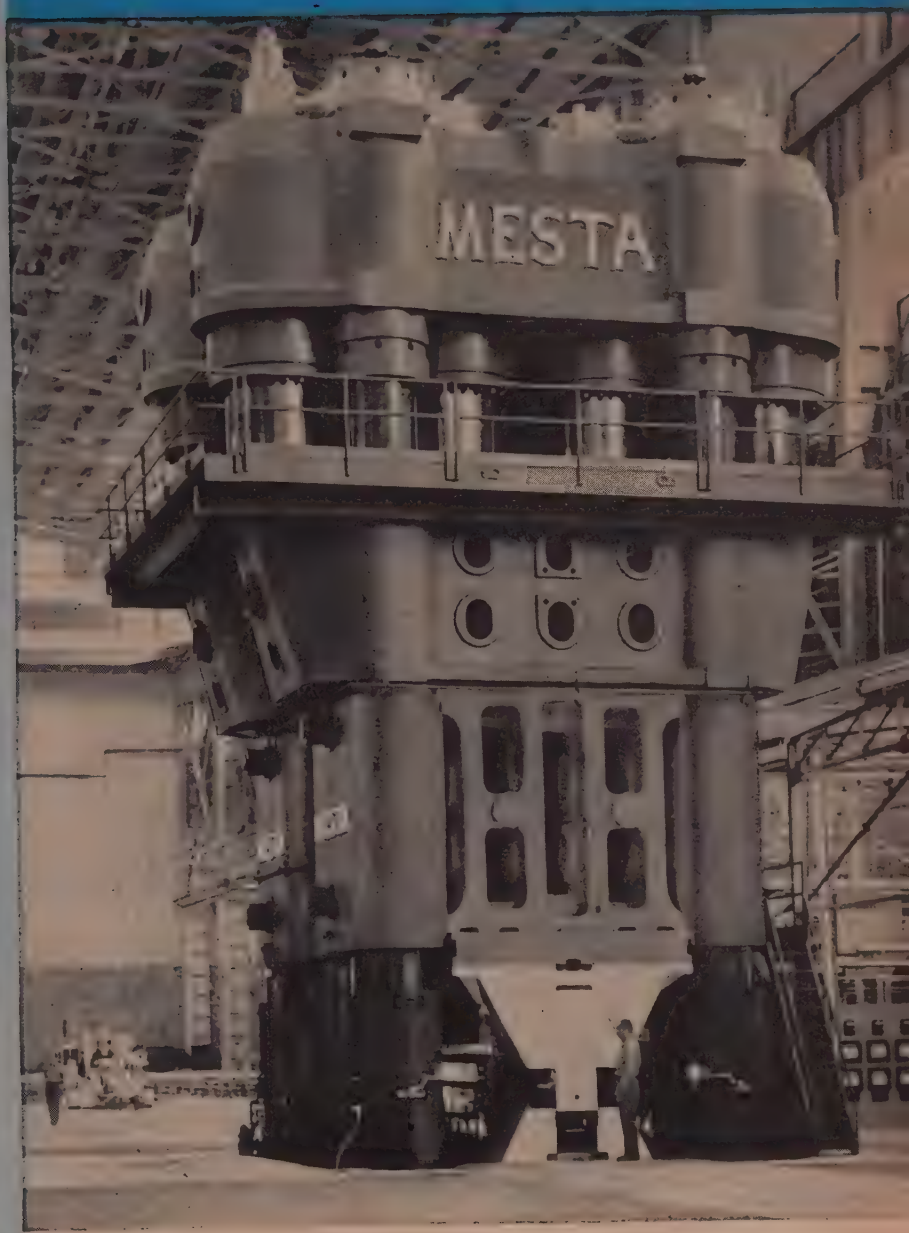

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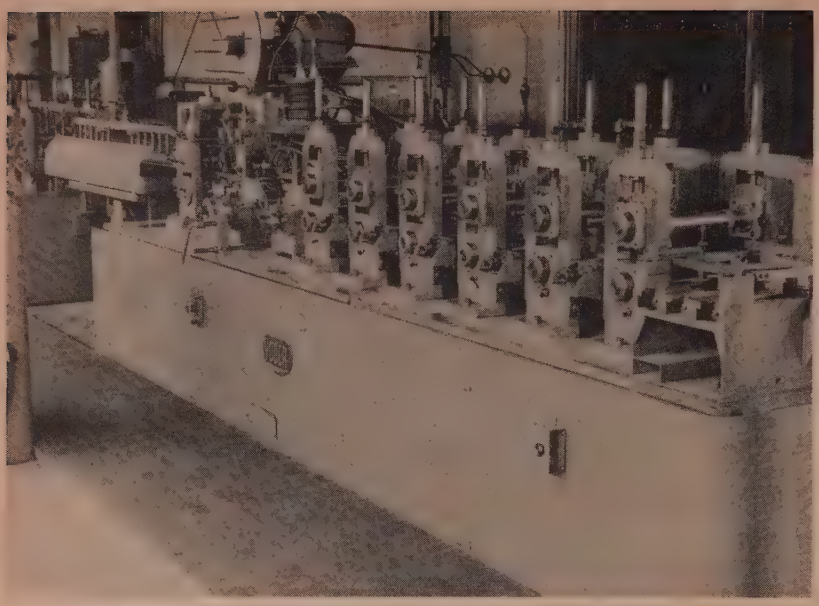


Combination Mill and Welder Cuts Down Time

The Yoder Co., 5539 Walworth Ave., Cleveland 2, Ohio, and New Rochelle Tool Corp., 320 Main St., New Rochelle, N. Y., have combined Yoder's M-2-RF Weld Tube Mill with New Rochelle's 50 KW resistance welder to make a set of equipment that produces welded tube continuously from aluminum and other metal coils.

The Thermatool high frequency resistance weld mill welds titanium, zircaloy and all the common metals at speeds of 300 ft. per minute or more. The companies cite some 47 installations around the world.

Work range of the mill pictured, which is used on aluminum and cold rolled steel at National Art Metal Co., Sydney, Australia, is ½" o.d. x .020 to 2¼ o.d. x .083.

New Roofing, Siding Sheet Goes to Market

Many advantages are claimed for a newly designed patterned aluminum roofing and siding sheet made by Nichols Wire & Aluminum Co., Davenport, Ia.

Called "Lap-Drain" the sheet is said to cut overhead costs by reducing or eliminating inventories of three conventional aluminum sheet types in two gauges and reducing accessory inventories to only three items, an accessory angle, a neoprene sealer strip and a new twin-thread nail assembled with neoprene washer.

"When you talk about potential inventory savings on conventional sheet, you have to be able to prove that the new sheet has so many special features that the jobber or dealer can build up a big volume," Edward C. Manix, vice president of Nichols said.

"Lap-Drain offers added sales features such as a new ribbed configuration, greater rigidity, lower cost per applied square, much better weathertightness, ease of application and the beauty of a glare-reducing patterned pebble finish," Manix said. "It has a better built-in drain trough, a siphon-breaker safety edge, which also provides greater rigidity, red nailing line for foolproof nailing, an alignment guide and an 'arm-span' width. These are backed by a national advertising program."

An extra advantage to jobbers and dealers is the fact that the new Nichols roofing and siding sheet is available in lengths from 6 to 12 feet in one-foot increments and in lengths from 14 to 24 feet in two-foot increments, all in convenient "arm-span" widths of 32 inches which provide 30 inches of coverage. Reduction in end and side lapping is one reason for the economical advantage of the Lap-Drain sheet.

"Nichols' Lap-Drain sheet is available throughout the country for the 1959 market, and preliminary acceptance has been remarkable," Manix reported.

Ferro Establishes Plant in Spain

Ferro Enamel Espanola is a new company in Bilbao, Spain, which is jointly owned by the Spanish firm of Union Quimica Del Norte De Espana, producer of chemicals, and Ferro Corp., 4150 E. 56th St., Cleveland, Ohio. The new half-million-dollar company will manufacture porcelain enamel and glaze frits and inorganic colors for sale throughout Spain.

Commenting on Ferro's 13th foreign subsidiary, board chairman R. A. Weaver said: "This new plant is part of our continuing policy of geographically dispersing our operations and expanding into markets which show considerable promise.

"We have been investigating the possibilities for our type of operation in Spain for more than a year, and assured of an excellent growth picture, have joined together with one of the country's leading chemical firms to manufacture our products there."

Ferro established its first foreign subsidiary in Canada in 1927, and since then has set up plants in ten other countries, and a sales division in Hong Kong.

West's Largest Dip Brazing Plant Now in Operation

A new aluminum dip brazing installation with the largest capacity in the West has been completed by Meridian Metalcraft, Inc., 8739 S. Millergrove Dr., Whittier, Calif., producer of waveguide components.

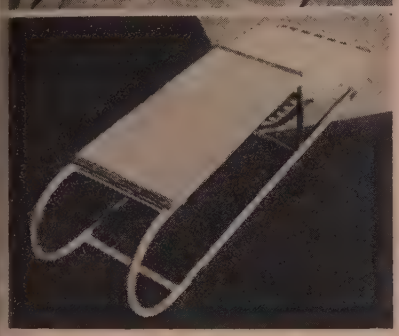
The new facility is equipped for quantity production of aluminum assemblies, including the large sizes used in aircraft and missiles. The main brazing tank is 60 inches deep and measures 36 by 36 inches.

C. M. Peterson, president of Meridian, said the entire installation was designed primarily to serve manufacturers in aircraft, missile and electronics fields. He predicted new applications in automobiles, machinery, office equipment and toys, now that an economical production brazing method has been developed.

Dip brazing enables fabricators of aluminum parts to eliminate hand welding. The new process enables them to fabricate assemblies from stock or machine formed shapes and braze the parts together into an integral unit in production quantities, without warpage or high scrap loss.

Chemically cleaned parts are fastened together on a jig, or by pins and clips, and a brazing alloy is placed at the face of each joint to be welded. The entire unit is preheated to 1000°F. and then dipped into molten salt and flux, which prepares the surface of the metal and forces the brazing alloy to flow into the joints, making a perfect weld.

Dip brazed joints are from 80% to 100% as strong as the parent material, according to Meridian, and corrosion resistance is at least as good as for other types of joining. Warpage due to uneven heating, common in fusion welding, is completely eliminated, the company asserts.



Welded Aluminum Makes Diving Board Portable

The "Spring King" portable diving board, a brainchild of Jack Lawson of Sacramento, Calif., combines portability and strength, and eliminates the bolting, upkeep, and costly repairs inherent in stationary diving boards.

When he created his new diving board, Lawson was interested in portability, strength, and economy of manufacture. He discovered that aluminum eliminated maintenance and provided portability; and that welding provided the strength and economy.

Since he was not a metal fabricator, he consulted H. B. Reubens Welding and Machine Shop, North Sacramento. His plans were adapted for manual Heliarc (inert-gas tungsten-arc) welding. Each unit, made of 1-inch diameter aluminum tubing, is welded with Heliarc HW-10 torches. Filler metal is Oxweld No. 23 aluminum rod, and the welds are protected by 99.995% pure Linde argon.

The result: a 35-lb. diving board that can be carried anywhere and can support over 1000 pounds. The platform is made of waterproof 5/8-in. exterior ply, covered with cocoa matting. The "Spring King" rests on rubber pads that can be adjusted to obtain secure footing on uneven surfaces. It carries a lifetime frame and workmanship guarantee. Its list price of $139.95 is less than standard diving board equipment.

As for the "spring," each unit is equipped with extra-heavy No. 4 Trampoline, along with specially constructed 3/8-in. diameter heavy shock cord—a combination that's sure to give "more bounce to the ounce."

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Decoiling, Shearing Line Features Dual Measuring

The combination of electronic surface measuring and positive mechanical measuring in a shear line now gives extreme flexibility in processing coil stock to sheets. It's a new optional feature added to new equipment made by Dahlstrom Machine Works, Inc., Chicago 41. Limitations formerly encountered when using a shear line with only one method of measuring are now nonexistent, Dahlstrom said.

Through actual field experience, Dahlstrom has found: Surface measuring to be ideal for light gauges at production speeds and heavier gauges at a speed proportionate to gauge; this system eliminates minimum and maximum length restrictions; also allows instantaneous length changeover. Tolerance is always based on a plus or minus factor.

Positive mechanical measuring is ideal for heavier gauges at production speeds and lighter gauges at a speed proportionate to gauge; this system has minimum length restrictions. Fast changeover of lengths can now be accomplished through a motorized screw arrangement with direct length reading to a decimal counter. Overhead trapping of metal on measuring conveyor minimizes compaction between measuring head and shear blades. Tolerance is always based on a plus factor only, Dahlstrom said.

Alcoa Develops Aluminum Pipe Welding Machine

An automatic pipe welding machine that welds aluminum pipe faster, better, and less expensively than ever before possible, has been designed and developed by Aluminum Co. of America. It is the first such machine capable of producing sound welds with full penetration, without use of back-up rings.

The machine has high welding speed —completing a pass on 4-inch pipe in 11 seconds. It is expected to further narrow the price gap between aluminum and steel pipelines.

The welder can handle all tubular products from four to 11 inches O.D. Mechanically operated clamps, which grip pipe during welding, are adjustable to all diameters in range. This makes possible machine welding of Unistrength, Alcoa's new variable-wall pipe, which has slightly larger O.D.'s at pipe ends than along the length.

For versatility, the head of the new consumable electrode machine can be positioned through a wide range of welding angles or set to oscillate, automatically moving back and forth across weld width to insure complete filling. And the Alcoa machine is specially designed to position pipe with solid metal contact around the circumference of butted pipe ends.

To simplify maintenance the electronic tubes, chronic trouble source in automatic units, have been replaced by extensive use of magnetic amplifiers and semi-conductors.

When the machine has been programmed for best welding results, vaporproof cabinets containing all electrical controls are locked to guard against damage. The torch can be tilted away from its welding position for fast servicing, without disturbing pipe in the machine. Wire feed speed and head rotation are variable during automatic operation. Machine head will not rotate until the welding arc is struck.

To use the automatic welder, the operator first positions pipe, in mechanically operated clamps. Final positioning and aligning also is done mechanically. By touching a button on the control panel, the operator rotates the head into position and lowers the welding wire. Pressing a button starts welding.

Navy Lubricating Oil Packaged in Aluminum

Some 80,000 deep-drawn one-quart aluminum cans, fabricated by Kaiser Aluminum & Chemical Corp. at its Wanatah, Ind., plant, are being used by Lehigh Chemical Corp., Chestertown, Md., to package synthetic lubricating oil for Navy jet engines.

Choice of the cans, which allows a weight savings of about two-thirds over conventional containers, marks the first time aluminum has been deep-drawn for such an application. This process eliminates side seams and bottom double seams which is expected to lessen chances of contamination and afford better protection for the lubricant.

The can's top is a normal double seamed closure. The new containers are also said to stack better because the bottom of the finished drawn can nests in the top of the can beneath it.

Lighting Firm Specifies Aluminum for Fixtures

Fluorescent light fixtures for gasoline station pump islands and other outdoor lighting installations are assembled almost entirely from aluminum alloy components by Columbia Electric & Mfg. Co., Spokane 10, Wash.

The 4- and 6-lamp units are made in 4-, 6-, 8- and 12-ft. lengths. The Underwriters Laboratories-approved fixtures are Alumilited to produce a coating thickness of no less than .0002-inch. The fixture cover, channel, and channel covers are 5005-H14 alloy sheet. The reflectors are made from 6063 extrusions, cut to length and machined, then heat treated to the T5 condition. Socket enclosures and reflector ends are die castings. Rivets are 5053 alloy.

"Due to the weight and the close fitting parts required to make our unit weathertight and the reflector adjustable, we have not considered galvanized steel parts," the company said. "Mi-T-Lite" fixtures are marketed nationally through General Electric Supply Corp. who in turn are serviced by some 27 factory representatives of Columbia.

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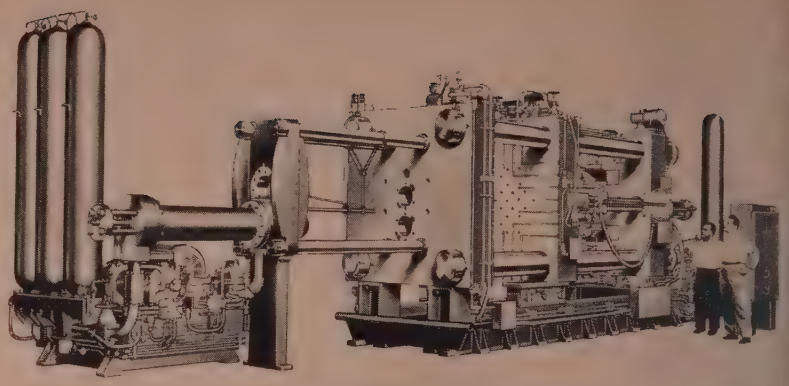

Giant Machine Die Casts up to 85 Lbs. of Aluminum Per Shot

This 2000-ton die casting machine, the largest of nine standard cold chamber machines built by Cast-Master, H-P-M Division-Koehring Co., Bedford, Ohio, was designed especially for the production of extremely large aluminum castings such as automobile door frames, motor blocks, large housings, etc. Aluminum castings weighing up to 85 pounds can be cast with this machine.

Refinements in the clamp and injection ends have resulted in outstanding performance in these machines, according to Cast-Master. The rugged die toggle mechanism, plus extra heavy platens (18 x 80 x 80 inches) and tie rods (11 inches) will withstand extreme injection pressures and provide maximum locking pressure to all four corners of the die plate.

The movable platen is guided on bronze bushings and supported on a roller carrier with an eccentric adjustment for height. It rolls on hardened rails which minimize wear and maintain platen alignment. The roller carrier is extended to support heavy dies.

The injection assembly is infinitely adjustable from minimum to maximum injection speed, the company reports. Rigid cylinder support mountings maintain accurate plunger alignment. Die stroke of the machine is 22 to 36 inches; injection cylinder stroke is from 30 to 44 inches; and space between tie bars is 51 inches, both vertically and horizontally.

80% Alumina Plastic Refractory Developed

A new 80% alumina plastic refractory, "Pitco 80" has been announced by the Refractories Division, H. K. Porter Co., Inc., Pittsburgh 19, Pa.

"Pitco 80 combines all of the advantages of monolithic construction, formerly available only in castables and ramming mixes, with the advantages of plastic construction," according to H. K. Porter Co. "It is air and gas tight with high thermal shock resistance. It withstands heavy loads and temperature variations, up to 3200°F., and delivers long service life. No special shapes are needed."

Porter "Pitco 80" is packaged in densified deaired slabs, is recommended to: balance refractory linings in high temperature furnace installations, and for linings where iron oxides and molten aluminum are prime causes of failure.

Specific applications of "Pitco 80" include aluminum reverberatory furnace, crucible furnace linings, around electrodes in electric furnace roofs, burner blocks, desulfurizing forehearths and holding ladles, and boiler target walls.

Heat Treatment Controls Cast Alloy's Properties

A new high-purity aluminum alloy "with unusually high physicals," has been developed by Rolle Manufacturing Co., Lansdale, Pa. Called MA-356, the alloy promises new weight saving efficiencies in sand and permanent mold castings for missiles and high performance jet aircraft.

By varying the chemical composition of standard A-356 alloy, Rolle has made the material highly responsive to heat treatment. Specific physicals can be emphasized as desired merely by careful control of heat treatment, the company reports.

Missile castings now being poured by Rolle in this new alloy regularly exceed the physicals specified in MIL-C-21180A. In the T-6 condition, ultimate tensile strength can be controlled within 40,000 to 50,0000 psi; yield strength within 30,000 and 40,000 psi; and elongation within 2% to 5%.

Significantly higher physicals than these have been achieved in favorable casting configurations, according to Rolle.

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To fully meet your requirements, Anaconda Aluminum combines this small-shop personality with the facilities to supply you aluminum in many forms—pig and ingot, coiled and flat sheet, rod, bar, structurals, tubing and other extruded shapes.

What you want, when you want it—that's the kind of service we offer aluminum buyers. To get it, call your local Anaconda Aluminum representative, or write our General Offices, Dept. M-6, Louisville 1, Kentucky.

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Oxygen Carrier Gives Greater Payload

The new Liqua-Guard oxygen truck transport, made by Cambridge Corp., Lowell, Mass., made its debut at the recent American Welding Society Show in Chicago.

Designated Model 2100L, the oxygen carrier features an all-aluminum vacuum jacketed tank with reinforced plastic cab and body trim. The gaseous equivalent of liquid oxygen carried in this truck is 234,000 SCF and represents an unusually high ratio of payload to gross weight, Cambridge reports.

Model 2100L is equipped with a high pressure pump and vaporizer for filling high pressure tube trailers, tube banks and cylinders. A medium pressure pump is provided to transfer liquid oxygen to those customers equipped to handle liquefied atmospheric gases. Both pumps on this new model are driven by mechanical power take-off.

"Liqua-Guard is a fully integrated mobile unit and provides versatile distribution of liquefied atmospheric gases," a Cambridge representative said.

Alcoa and Kaiser in Experimental Venture

Alcoa and Kaiser have joined three previously announced suppliers and Pennsylvania Electric Co. in building a 460 KV experimental line, according to Louis H. Roddis, Jr., Penelec president.

The two aluminum producers will jointly supply approximately 728,000 pounds of aluminum transmission cable. Included will be 1.5 line miles of 2.32 inch diameter single conductor; 3.7 line miles of twin bundle 1.4 inch diameter expanded core ACSR conductor; 3.7 line miles of twin bundle 1.6 inch diameter expanded ACSR and 3.7 line miles of twin bundle 1.75 inch expanded ACSR.

Each company will supply one-half of the conductor in each size listed and will join with Penelec in studying the carrying capacity, erection problems and performance of the four different conductors at extra high voltages.

In the 12.6 miles between Saxton, in Bedford County, and Claysburg, in Blair County, the line will cross two rugged mountain ranges and pass through a narrow valley. This provides geographical and meteorological conditions representative of the entire Penelec system and will permit testing of equipment under conditions imposed by snow, sleet, wind and severe lightning.

A two-circuit 115,000 volt line now connects Saxton and Claysburg substations. Thus, it will be possible to test the 460 KV line under actual operating conditions without interfering with service continuity as the load can be switched to the existing lines from the experimental line at any time. These lines will also serve as a check for testing new construction techniques.

It was previously announced that General Electric Co. will supply a 115/460 KV transformer for one terminal and switching equipment for both ends and that Pennsylvania Transformer Co. will supply a duplicate transformer for the second terminal. G. E. will also supply complete lightning arrester protection and will join with Ohio Brass Co. in designing the insulators and insulator hardware.

Dow Develops Die Cast Alloy For High Temperature Use

Development of the first die casting alloy for service above 500° F has been announced by The Dow Chemical Co., Midland, Mich. The new member of the magnesium-thorium group of alloys contains approximately 1% thorium, 1% manganese, balance magnesium.

Designated HM11XA, the new alloy retains good mechanical properties through 800° F, according to Dow. Sev

al HM11XA parts produced in Dow's e casting facilities are currently being valuated in aircraft and missile applica- ons.

Besides being the first die casting loy in any metal for service at these evated temperatures, HM11XA also atures minimum weight, having a ensity of only 0.064 pounds per cubic ch, Dow said.

Separately die cast test bars of the lloy exhibited average tensile strength f 30,200 psi at 70° F, 16,800 psi at 00° F, 12,400 psi at 600° F and 7,800 si at 800° F. The alloy can be die cast n regular equipment with a minimum f changes from standard procedure, ccording to Dow.

Radiographic studies indicate that arts cast in HM11XA have internal oundness equivalent to that of die cast Z91B, the standard magnesium die asting alloy. Room-temperature tensile ield strength of HM11XA is almost quivalent to that of AZ91B, and the ew alloy can be finished with nearly ll of the finishes currently used on nagnesium.

HM11XA is the fourth member of the nagnesium-thorium family to be intro- luced by Dow. The company also pro- luces HK31A in sheet and sand cast orm and as forging stock; HM21A in heet form and as forging stock, and HM31A in extruded form.

Revere Bauxite Fleet Growing

The second of three specially designed bauxite ore carriers built for Ormet Corp., is named the Revere, after the American patriot who was also founder of Revere Copper and Brass Inc.

The Revere and her sister ships will transport bauxite from Smalkalden, Surinam, on the northeast coast of South America, to Burnside, La., on the Mississippi River as part of the operations of Ormet.

The Revere is decorated with six glass panels and three mosaic panels which illustrate some of the events in the life of the "Midnight rider" and pioneer industrialist who in 1801 erected the first successful copper rolling mill in America.

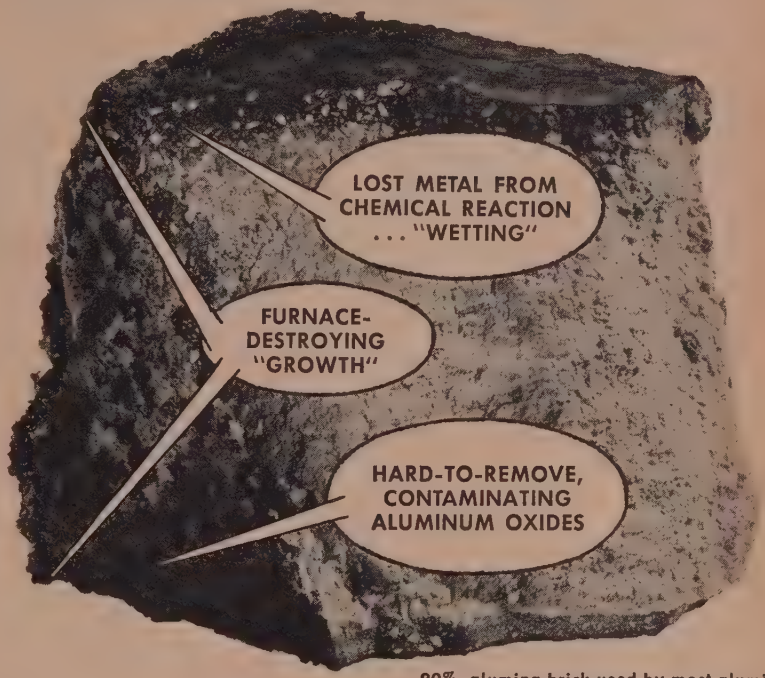
The Ormet ships have an over-all length of 603 ft. and a service speed of about 14.3 knots at designed full load draft. Displacement tonnage at 25 ft. draft is 25,575 long tons.

The cargoes of bauxite will be carried to the Burnside Bulk Marine Terminal which is adjacent to the Ormet Corp. alumina plant. Alumina produced at Burnside is shipped by a fleet of 36 specially designed barges up the Mississippi and Ohio Rivers to Ormet's Hannibal, Ohio reduction plant.

ALUMINUM REMELT FURNACES:

Porter "Multex-85"

avoids these refractory problems in lower side-walls and bottoms . . .

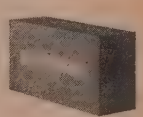


90% alumina brick used by most aluminum furnace operators as a hearth refractory

You've seen the conditions illustrated here, in your own furnaces! These are the typical, costly problems encountered with most refractories for aluminum furnaces! Porter "Multex-85" can virtually eliminate these irritating furnace conditions, *and* give you improved metal quality. "Multex-85" costs less than most aluminum refractories, cuts cleaning costs, results in virtually no metal loss (and is easily and economically removed).

We can show you countless test results that are already a matter of record. But the best comparison is a "Multex-85" lining tried under *your* operating conditions. Installed and operated according to accepted good practices, a "Multex-85" lining will give you better results than your present refractory . . . *a difference you can count in dollars.*

For complete information write: *Mullite Works, Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*



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The Aluminum Man*...

*Twenty-five years a communicator of new pro
ress in metals, Joseph C. Barr—salesman f
Alcoa distributor Williams and Company, Inc
of Pittsburgh, Pennsylvania—is typical of t
men who make service to industry their care
. . . through knowledge of aluminum!

He offers a new slant on railing

ew installation economy and ease . . . high corrosion resist-ce and drastically reduced maintenance cost! These are e money-saving advantages of the versatile new railing w offered by your local Alcoa distributor salesman—*e Aluminum Man!*

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Check *The Aluminum Man* now for specific details on *where*, *how* and *why* this newest Alcoa "product for progress" for business and industry can reduce installation and maintenance expense, provide dependable protection and colorful, attractive appearance for *your* building.

Remember—his advice and the technical aid of the aluminum pioneer that backs him are yours for the asking whether you need a *few* pounds or *thousands* of pounds of *Alcoa Aluminum* . . . the light metal with the bright future that's being seen in more places . . . more and more!

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ALUMINUM COMPANY OF AMERICA

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inkle Supply Co., Inc., FAirfax 2-4541
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Pacific Metal Co. . . . 3-6468

ILLINOIS
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Central Steel and Wire Company
REpublic 7-3000
The Corey Steel Co., BIshop 2-3000
Steel Sales Corp. . . . BIshop 7-7700
INDIANA
Indianapolis
Steel Sales Co. of Indiana, Inc., LIberty 6-1535
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Marsh Steel & Aluminum Co.
WHitehall 2-3231
Metal Goods Corp., AMherst 5-3191
KENTUCKY
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Williams & Co., Inc., JUniper 3-7781
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MARYLAND
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Brace-Mueller-Huntley, Inc.
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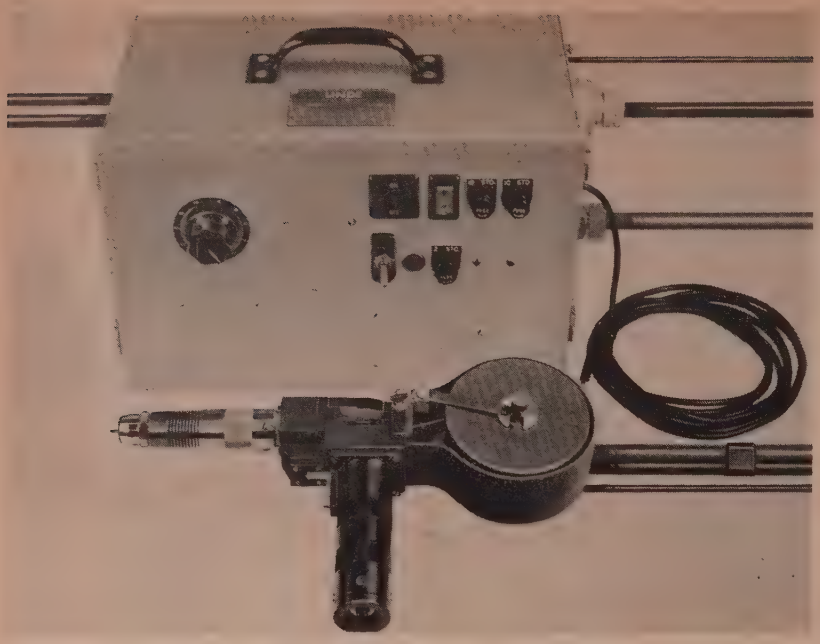
Aluminum Products—Hawaii, Honolulu 14, **HAWAII**

luminum Company of America, 937-F Alcoa Building, Pittsburgh 19, Pennsylvania



Manual "Sigma" Welding Torch Is Portable

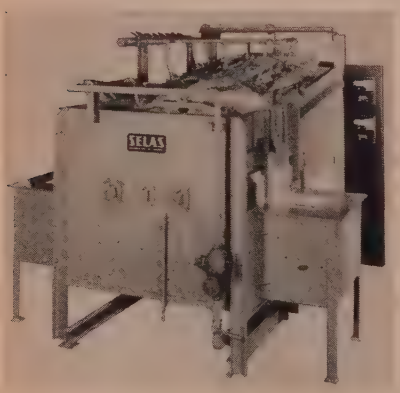
For consumable-electrode inert-gas metal-arc welding, Linde Co.'s Sigmette torch combines portability and easy maintenance.

The wire spool mounted on the torch lets the operator get at jobs in confined spaces and areas remote from power and gas supply. Moving heavy equipment is eliminated. Designed for welding jobs where maximum portability is required, the Sigmette weighs three pounds, and the control box weighs less than 20 pounds.

Rated at 200 amperes, the torch will handle the full welding range with 3/64-in. aluminum wire; applications on aluminum .093 to 1/8-in. thick, using .030-in. wire up to 125 amperes; limited applications with 1/16-in. aluminum wire; and .030-in. carbon steel wire. Torches are available for the full welding range with either .030 or 1/16-in. aluminum wire.

The Sigmette is easy to maintain, Linde reports; a screwdriver is the only tool necessary. Internal parts, including the electric wire feed motor in the handle, are easily accessible. Of special interest is the high safety factor: Since the torch and component control are completely insulated, the operator is protected from contact with electrically "hot" parts.

Dry Hearth Furnace Is Precise, Economical



Precise control of the melting of high purity, electrical quality aluminum is a feature of this new two-section dry hearth furnace.

Both dry and wet sections of the furnace, designed and constructed by Selas Corp. of America, Dresher, Pa., are roof-fired with Duradiant burners. This gradiation method of heating not only eliminates direct flame impingement and avoids any contamination of the aluminum, but provides the close control of heat input so vitally necessary. Further assurance of aluminum purity is provided by a special lining in the furnace to minimize contamination.

All melting is accomplished in the melting zone and the metal flows to the holding section, without any overheating, while the pure metal separates from its oxide counterpart. The critical metal temperature in the holding section is maintained to within extremely close limits due to the controllability of heat input from the Duradiant burners and absence of any cold charges. Dross formation is held to a minimum because of absence of stirring or other agitation.

Unusual fuel economy is realized in the melting operation with the use of approximately 1 cu. ft. of natural gas per 1-lb. of aluminum melted. The special insulating refractory materials used increase working comfort considerably around the furnace.

Selas reports that a leading manufacturer of electrical conductor has installed this model.

Alcan Increases Production at Kingston

The Aluminum Co. of Canada, Ltd., principal subsidiary of Aluminium Limited, announced that the capacity of its sheet mill at Kingston, Ontario, will be increased by 10,000 tons per year.

The Kingston plant has been in operation for nineteen years producing aluminum sheet, foil, forgings, tubing, structural shapes, architectural shapes and other extrusions. "Expansion of the sheet rolling facilities is being made in an effort to satisfy the growing demand in Canada for this product," company officials stated.

The increased capacity will be obtained by the addition of some new equipment and alterations to existing equipment at an estimated cost of $2 million. No new building construction is involved.

Asarco Introduces New Bendable Casting Alloy

A new aluminum alloy with unique mechanical characteristics has been developed by the Federated Metals Division of American Smelting and Refining Co. Tradenamed "Adaptaloy," its properties include exceptionally high elongation and impact strength and the ability to sustain bending and deformation. No special treatment of any kind is required during casting and any mold medium may be used, except that at present the alloy is not recommended for die-casting.

In tensile strength, yield strength and hardness, the characteristics of Adaptaloy are the same order as 43 alloy and Asarco's F 050. The mechanical properties are:

Tensile strength, psi	22,000-25,000
Yield strength, psi	8,000-10,000
Elongation %	7-11
Hardness BHN	48
Charpy Impact strength, ft. lbs.	
Notched	4-5
Unnotched	15-20

Its ductility, elongation, malleability and high impact strength make Adaptaloy particularly useful for castings which require bending or deformation such as furniture parts where bending is required during fabrication, grills that have to be bent to conform to various contours, or clamps which must fit a variety of diameters.

Adaptaloy is specifically formulated for applications such as the manufactu

DRAW BENCHES

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Pinch Rolls

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Rotary Bar Pointers

Run-Out Tables

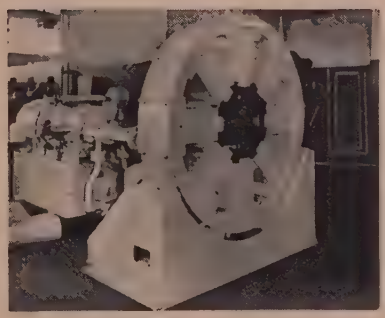
Gag Straightening Presses

Rotary Roll Straighteners

Cracker Shears

Bar Shears

BULL BLOCK



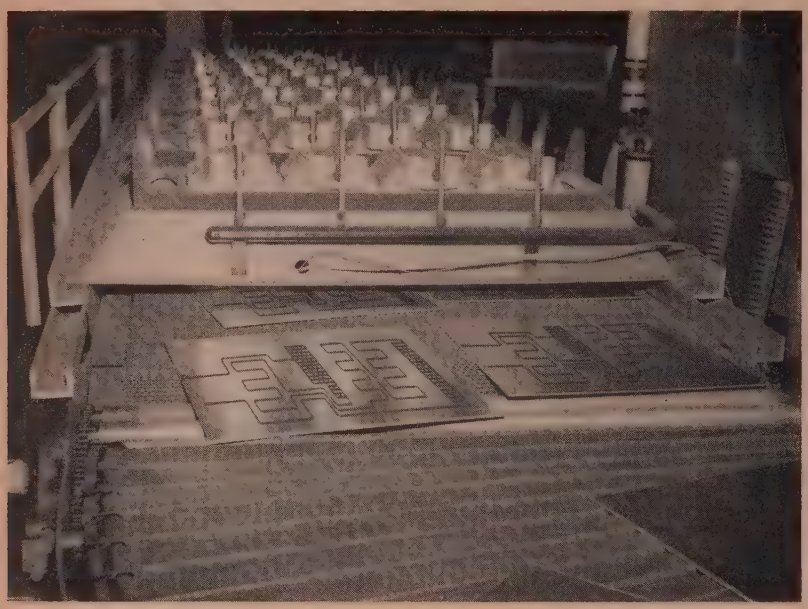
SQUEEZE POINTER

BLAW-KNOX COMPANY

AETNA-STANDARD DIVISION

FRICK BUILDING, PITTSBURGH, PA.

of structural castings designed to operate under a specific load and to deform when overloaded, castings with ears or projections which must be peened over for assembly, and for parts where bending under strain is desired. It can, of course, be anodized to yield a white surface which may be dyed any color.



Gas Fired Heaters Speed Continuous Drying

Gas-fired infra-red radiant heaters are replacing the electric radiant type in drying metal ink for "Tubed Sheet" production at Reynolds Metals' Louisville, Ky. plant. The move has eliminated production tie-ups and reduced drying costs.

The ink is used for printing tube patterns in the manufacture of "Tubed Sheet," Reynolds' sheet aluminum with integral tube circuits. "Tubed Sheet" is made by printing a reduced-size circuit pattern on one sheet and bonding another to it in a rolling mill which also expands the size of the sheet and the pattern four times. The ink prevents bonding of the printed surfaces which are expanded into tube circuits by fluid under pressure after rolling is completed.

The continuous production line called for conventional electrical radiant heaters mounted over a conveyor between printing machine and rolling mill. Actual operation revealed, however, that more radiant heat was required than was provided by the ten-bank, 200 KW system originally installed. The printed surfaces were smearing when the second sheet was placed on the first. Faster drying required either more electrical heaters and lengthened conveyor travel or more powerful heaters. Reynolds obtained the latter by substituting a single bank of ten gas-fired infra-red heaters for four banks of the electrical units. The new units are Perfection-Schwank infrared heat generators of Perfection Industries, Division of Hupp Corp., Cleveland, 10.

The gas-fired units were installed directly over the line (see photo) in the same manner as the electrical radiant heaters. Because of the high capacity of the gas units — 48,000 BTUH each — it was possible to install a bank of 480,000 BTUH capacity over 22 feet of conveyor.

The units operate at high efficiency, converting 60% of fuel input into infrared rays of lengths (1.5 to 6 microns) readily absorbed by the metal ink. This range of infrared wave length is generated by an element surface temperature of 1600° F. The ceramic heating unit is perforated with 200 small holes per square inch. Air drawn from the atmosphere and gas are mixed in a chamber behind the ceramic and passed through the small holes. A separate flame burns at each hole and the entire combustion takes place within one-eighth inch of the ceramic face. The rear surface of the ceramic doesn't exceed 400° F.

In addtion to solving the fast drying problem, the new heaters cut Reynolds' operating costs. With approximately half the drying being done by gas, operating costs are down one-third. When the entire line is converted, drying cost will be 1/6 that of the original installation.

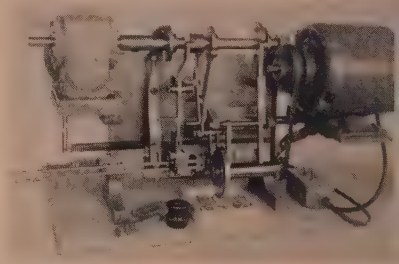
Initial installation cost of the gas-fired equipment is also less and the heaters last indefinitely, requiring only occasional cleaning for maintenance.

Mexico Refractories Becomes Kaiser Division

A merger agreement between Kaiser Aluminum & Chemical Corp. and Mexico Refractories Co., Mexico, Missouri, has been approved by the boards of directors of both companies. Mexico Refractories will join Kaiser Aluminum, operating as a division in conjunction with the Kaiser Chemicals Div., in the production and sales of refractory products for high temperature industrial application.

"The new, combined organization will be in a position to supply a complete refractory service to industrial users," declared F. M. Cashin, vice president and general manager of Kaiser Chemicals Division. Kaiser supplies basic refractories, made primarily from magnesia grains, to the steel, glass, cement and copper industries. Mexico Refractories supplies fire clay, silica and alumina refractories and specialty products to the same industries as well as to others including the aluminum, lime, ceramic, oil and chemical industries.

Mexico Refractories was established in 1930 and operates three plants in the U. S. and one in Canada under the name of Refractories Engineering & Supplies Ltd., at Bronte, Ontario.



Precision Tube Cutting Machine Is Fast, Flexible

A new automatic cut-off machine that cuts small diameter, round tubing at up to 12,000 pieces per hour is announced by H & H Machine Co., Inc., Noble and Jackson Sts., Norristown, Pa.

Basically designed for volume users of aluminum, copper, brass, or other copper alloy tubing up to 7/16 inch O.D., the new machine provides precision cutting within ± 0.005-in. of piece length for cut-off lengths up to two inches. It can also handle certain plastics such as polyvinyl chloride. It has a dual feed to cut from 6000 to 12,000 pieces per hour, the rate varying with tubing O.D. and wall thickness.

Within these sizes and materials, one machine cuts all types of tubing and all sizes. The user requires no additional tooling and need buy no collets or bushings.

Without stopping the machine, an operator can start fresh lengths of tub-

; thus maintaining high production. can service two or three machines, l set up individual jobs in 15 min- s, thus obtaining significant savings time even on relatively small, irregu- ly scheduled production runs.

affolding is Reinforced ith Aluminum

An aluminum-reinforced scaffold that nbines durability with the desirable alities of traditional timber, is a new oduct of Gowsafe Board Ltd., Shef- d 10, England.

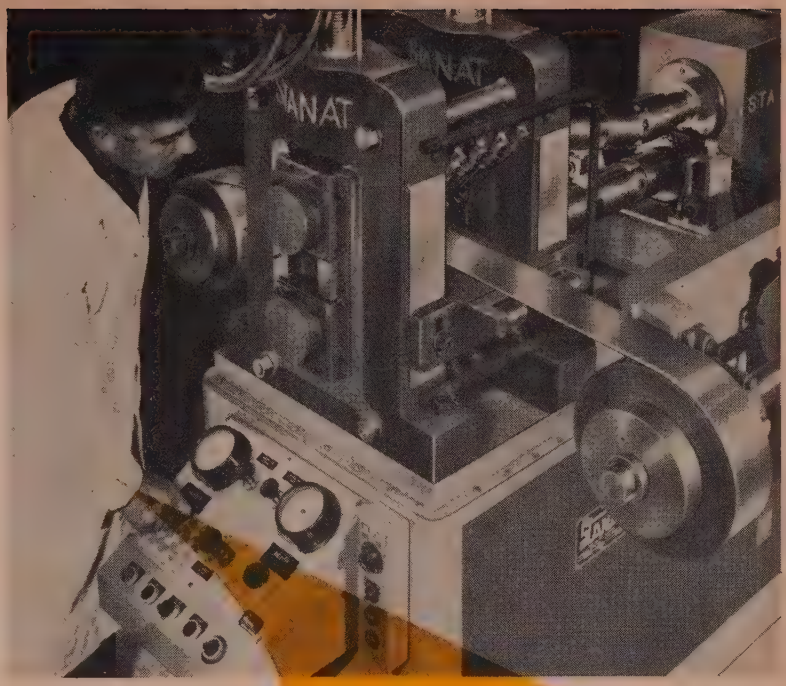
The Gowsafe board is suitable for all ffolding purposes and is particularly ommended for use in "flighting" and ier work involving frequent handling, ording to the manufacturer.

The new board is constructed of five gitudinal machined timbers, 1⅞-in. ⅞-in. and four aluminum strips tied nsversely by bolts at 15 in. centers, h bolt in the timber being bushed h aluminum tubing which acts as a ring and stop. The pattern of alu- num strips, bushes and bolts forms a mplete grid of reinforcement inde- ndent of the timber. All nut heads rounded for comfortable handling. e aluminum strips and tubing are plied by Northern Aluminium Co. d., and are 1¾ x 0.080 inch and ⅜ D. x 0.060 inch wall respectively.

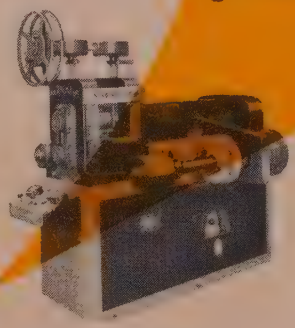
The board can be supplied in lengths ging from 7 feet to 15 feet, 9 inches increments of 15 inches and can be plied up to 18 feet, 3 inches to cial order. Each board is designed a safe working load of 280 pounds the center. The board may be given ater strength by the addition of ex- aluminum strips.

ictor Industries Head arks Further Expansion

Victor Muscat, peripatetic industrial- whose activities are centered in alu- num collapsible tube manufacturing t also include insurance, furniture d fertilizer, heads a syndicate that s acquired a furniture and cabinet ant of the Crosley Division of Avco



ALL PURPOSE ROLLING MILL WITH *Low Cost Reversing* FEATURE!

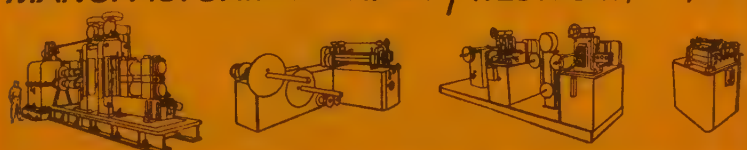


Now! You can have a complete reversing strip mill facility, for less than you ever thought possible. With a Stanat 2-high/4-high combination mill, the two-way strip winding arrangement (as illustrated) is driven from the mill motor. Powerful air clutches provide extremely sensitive control over a wide range of tensions.

Developed especially to meet the demand for a low cost, high precision rolling mill for use in laboratories and pilot production plants, these new Stanat mills are available with a complete line of accessories which can be furnished with the mill, or added later. Even the reversing mill feature can be added at a later date.

■ **Stanat builds a complete line of laboratory and production rolling mills in a variety of sizes. Find out more about these economical rolling mills today.**

STANAT MANUFACTURING CO., INC. | 500 SHAMES DRIVE WESTBURY, L. I., N.Y.



MFR'S OF ROLLING MILLS, GANG SLITTERS, WIRE FLATTENING MILLS, ROLLER LEVELERS AND BULL BLOCKS

Mfg. Corp., Cincinnati, Ohio. The plant, one of four such owned by Crosley, is located in Carrollton, Ky.

Muscat, president of Victor Industries Corp., Greenwich, Conn., pointed out that the acquisition "is completely in line with the current diversification" which he and his associates "have been planning for our various world-wide operations."

Last year, United States Can Corp., a Victor Industries firm, commenced production of aluminum aerosol cans at the Newport, Ark. plant of Victor Metal Products Corp., Muscat's roll-up tube company. At that time it was claimed that the aluminum cans were priced 2.3% under similar steel containers.

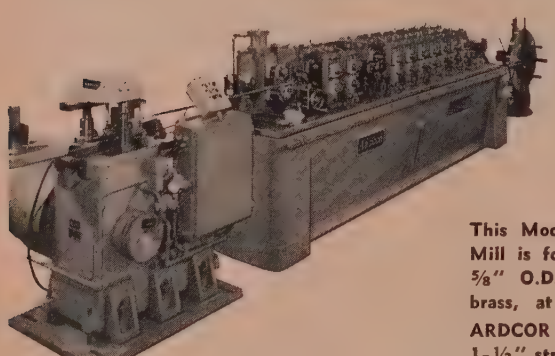
Recently it was reported that the industrialist had visited with Cuban and Panamanian government officials during which aluminum fabricating projects in those countries were discussed. Muscat is said to have proposed that the two governments raise tariffs on all canned and packaged imports which would force foreign countries to ship their products in bulk for packaging in these countries, thus raising the employment levels and encouraging foreign investment.

Victor Industries is already operating aluminum fabricating businesses in Venezuela, Mexico and Canada.

AMERICAN ROLLER DIE CORP.
ARDCOR

NEW LOCK SEAM TUBE MILL

Maximum Capacity Up To 1" O.D.



This Model SF Lock Seam Tube Mill is forming TV table legs of 5/8" O.D., .016" wall simulated brass, at 120 f.p.m. Cutoff is ARDCOR Model 10 Press with 1-1/2" stroke, 60 strokes per min.

The new small Model SF ARDCOR Machine features: High production speeds; roll space 5.5"; spindles 1.5"; new style rugged base with tool compartment and slanted front recessed for better operator stance; special narrow side roll stands with close 10" horizontal centers; fixed spur gears; quiet running all V-belt drive; compact 3-roll straightener; low voltage protection. Basic machine readily converted to a Cold Roll Forming Machine.

ARDCOR Roll Forming Machines and Lock Seam Tube Mills are available in seven standard sizes, other sizes to customer specifications.

If your products can be cold roll formed, ARDCOR engineers can supply advancements in design and machine construction to produce them better . . . at greater speeds and profit.

Consult our Engineering Facilities, without obligation . . .

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DESIGNERS, ENGINEERS AND BUILDERS: Single Roll Forming Machines or Completely Automated Production Lines for Cold Forming, Ferrous and Non-Ferrous. Electric Weld and Lock Seam Tube Mills • Forming Rolls, Tubing and Pipe Rolls • Straightening, Pinch and Leveller Rolls • Cut-Off Machines • Slitters

New Tooling Plate Has Improved Machinability

Aluminum tooling plate, direct chill during casting, achieves a much high degree of density and stability than h been previously possible, according its manufacturer, Pioneer Aluminu Inc., Los Angeles 45, Calif.

Characteristics include fine grain, u form molecular structure, and improv mechanical properties and machinab ity. Ease of fabrication of Pione 921-T-DC has cut users' labor costs much as 40%, the company reports, a the 32 micro-inch surface finish oft makes additional machining unnec sary.

In the direct chill casting procedu the molten aluminum is poured into water-cooled mold which instantly coo all four edges, giving the plate great density, lower porosity, and high mechanical properties, Pioneer said.

Standard thickness tolerance is ± .01 inch and standard flatness tolerance ¾-inch thickness or over is ± .005-inc

The easily weldable material is ma in standard and special sizes up to by 192 inches, and from ¼-in. to inches thick. It is easily sawed, tappe milled and allows speeds up to 60 FPM in turning, milling and drillin It is a non-sparking alloy, and high resistant to corrosion.

British Aluminium To "Exploit All Markets"

The worldwide abundance of alum num is a blessing in disguise, followi a poor year for the metal in 1958, a cording to a report to stockholders Sir Ivan Stedeford, board chairman British Aluminium, Ltd. Such factors unused capacity and highly competiti conditions should not be allowed to co fuse the situation, he said.

"For the first time in a generatio the world has an abundant supply

ne metal, with still more capacity planned, in construction, and coming into production," he added. "A factor . . . which in the past has seriously inhibited the natural growth in use of aluminum, particularly in the U.K., has been the shortages which persisted for many years. This has retarded development of really big markets."

With a current abundance, and newly acquired resources, the company is now prepared to vigorously exploit markets in all fields, according to Stedeford, who was the spearhead of the joint drive of Tube Investments, Ltd. and Reynolds Metals Co. which captured control of British Aluminium (see MM, Jan. '59, page 84).

Sir Ivan indicated that the 17½% dividend rate paid British Aluminium stockholders last year was not justified and that subsequent dividends would be based on a "sound financial and dividend policy."

Aluminum, Plastic Foam Make Strong Panels

The nine men standing on this building panel weigh about 1800 pounds and demonstrate the strength and rigidity of the new product, now under test by Allied Chemical's National Aniline Division, Buffalo, N. Y.

The panels are part of the Division's extensive diisocyanate application program, and are currently being used as the sole structural item for a one-story test building. No supporting members are used. The foam core material employs Nacconate 1080H and PFR-6.

The panels have exterior skins of aluminum. Interior skins are plywood, except for roof panels which have aluminum on both surfaces. The panels were joined together and anchored to the foundation by filling slots between them with a high density rigid foam.

The urethane foam has a density of 2 pounds per cubic foot. Two-inch thickness is used in the side walls; three inches in the roof. The panels were preformed in a heavy jig in National's

For greater ease in aluminum drawing

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OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 SERVICE MEN • OVER 160 MATERIALS

Oakite DRAW CLEAN "M" gives smooth drawing of aluminum —cleans off fast

Using Oakite DRAW CLEAN "M" lubricant means a lower reject rate on drawing and forming aluminum. Reason: It clings to metal so tenaciously that pressures of 40 thousand psi, encountered in drawing and punching cannot wipe it off. The thinnest film will prevent seizure that leads to build-up, galling, and scratching.

All ingredients are soluble and, at annealing temperatures, volatile. This means that while it clings where most compounds wipe off, nevertheless, it is most easy to remove when necessary. And the residue, if left on, is not harmful to metal or personnel.

Oakite DRAW CLEAN "M" lubricant offers astonishing savings. By diluting with water in ratios as high as 1 to 9 it extends die life three times the previous experience. Miscible with both water and oil, it is adaptable to any of the following:

light stamping	stretch forming	tapping
deep drawing	tube bending	spinning
cold heading	wet grinding	punching

Oakite Bulletin F-10393 tells you the whole story. For your free copy ask your Oakite man or write Oakite Products, Inc., 45B Rector Street, New York 6, N. Y.

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LIGHT METALS INDUSTRY

The ten industry groups and 71 product categories listed at the right IS the Light Metals Industry. This listing, plus the number of plants shown in the right-hand column, was compiled from the circulation files of Modern Metals. All of these plants get Modern Metals regularly and top-level men in those plants read it for the type of what's-ahead light metals information you'll find in this issue.

OVER 2 MILLION TONS . . .

. . . of aluminum, magnesium and titanium will be consumed by these metal processing and product manufacturing plants in 1959. Here's where the metal will go:

INDUSTRY	TONS
Building	500,000
Transportation	420,000
Consumer Durables	300,000
Machinery & Equipment	200,000
Electrical & Communication	180,000
Packaging	100,000
Processors	100,000
Scientific & Technical	70,000
Ordnance & Military	40,000
Miscellaneous Manufacturing	90,000

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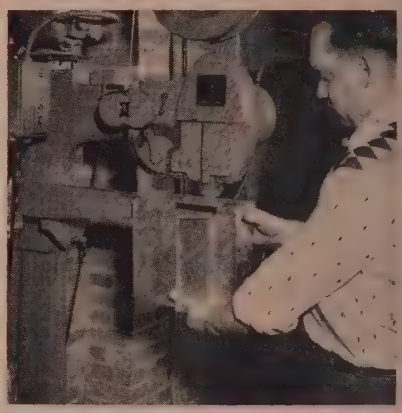
Chicago 11, Ill.

INDUSTRY AND PRODUCT	NO. OF PLANTS
BUILDING INDUSTRY	**6950**
Awnings, blinds, louvers, canopies	597
Roofing, siding, shingles, etc.	120
Air conditioning, heating, ventilating	646
Fabricators, architectural & ornamental	2058
Fabricators, sheet metal	1130
Prefabricated buildings, mobile homes	241
Windows, doors, curtain walls, storefronts	1501
Hardware, weatherstrip, insul., fittings	657
CONSUMER DURABLE GOODS	**1981**
Appliances, small: Irons, mixers, etc.	160
Furniture: Outdoor, office, household	548
Houseware, giftware, gadgets	285
Lawn mowers, tillers, rakes, fencing	209
Refrig., freezers, washers, ranges, etc.	427
Toys & sporting goods	272
Utensils, all types	80
CONTAINERS & PACKAGING	**598**
Caps, closures, collapsible tubes	77
Foil converters: Cosmetic, food, beverage	79
Containers, all types	236
Shipping & luggage	26
Spools & reels	22
Drums, barrels, receptacles	40
Tanks, all types	83
Containers, household	35
ELECTRICAL INDUSTRY	**2019**
Communications: Radio, TV, phone	469
Electronics: Equipment & parts	570
Electrical equipment, heavy	106
Electrical equipment, light	87
Fixtures & fittings, incl. lighting	429
Motors, heavy & light	160
Wire & cable	198
MACH. & EQUIP. (NON-ELECT.)	**2634**
Industrial, general purpose	515
Engines	181
Mining & construction	80
Compressors, pumps, blowers, valves	449
Agricultural & dairy	388
Ladders & scaffolds	137
Materials handling	350
Office & store	224
Tools, portable & hand	310
SCIENTIFIC & TECHNICAL EQUIP.	**954**
Measuring & controlling	286
Aircraft, navigation, vehicle	241
Laboratory & professional	123
Safety equipment	94
Orthopedic & medical appliances	90
Photographic & optical	120
TRANSPORTATION & PARTS	**1920**
Aircraft, military & commercial	458
Hardware, aircraft & vehicle	118
Highway signs, bridge rails, light poles	44
Automobiles, buses, trucks	658
Trailers & truck trailers	294
Marine: Ships, boats, etc.	208
Railroad	71
Bicycles, scooters, carts, etc.	69
ORDNANCE & MILITARY	**132**
Weapons	34
Army	20
Air Force	10
Navy	12
Atomic energy & advanced weapons	56
LIGHT METALS PROCESSORS	**7014**
Die casting plants	1050
Foundries, sand & permanent mold	2137
Extruders & tube producers	247
Fabricators: Draw., form., stamp'g	2394
Finishers: Anodizing, plating, etc.	293
Forging, impact extruding plants	78
Fastener mfrs.: Screw machine shops	668
Reduction plants & smelters	97
Sheet, plate, foil mills	50
MISCELLANEOUS INDUSTRIES	**1137**
Chemical & metallurgical	127
Manufacturing, special & misc.	446
Signs, nameplates, displays, frames	320
Metal specialty manufacturers	244
U.S. TOTAL	**25,339**

Diisocyanate Application Laboratory. The jig was designed especially for this work and has been used also to make panels for construction of a refrigerated trailer which is now performing satisfactorily in road tests. In overall insulation efficiency, this trailer was considerably superior to one with conventional insulation, according to National.



Versatile Stitching Machine Demonstrated at Show

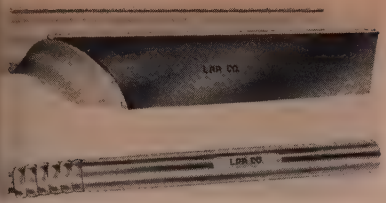
The versatility of metal stitching was demonstrated at the Design Engineering Show in Philadelphia, last month, by Acme Steel Co., Chicago 27. The technique consists of forming a metal stitch, driving it through the pieces to be joined and clinching it on the other side. Acme used its N2F stitching machine, pictured above.

Metals most frequently stitched are flat rolled and extruded aluminum, hot and cold rolled steel, stainless steel, soft sheet brass and sheet copper. Nonmetallic materials most frequently stitched are sheet cork, leather, sheet asbestos, fibreboard, pressed wood, sponge and solid rubber, phenolics and other plastics, solid wood and plywood.

Although actual production rates average about 100 stitches per minute, the N2F machine is capable of speeds from 280 to 325 stitches per minute. Stitches can be applied to work to be joined perpendicular, parallel or diagonal to the line of pull. The process requires no preparation of work to be joined, and painted and galvanized surfaces are undisturbed by the application of the stitches.

Metal stitching is simple and initial costs are low, Acme points out. And since the stitcher itself is operated by a fractional HP motor, power requirements are minimal.

"Today, metal stitching is being used in assembly operations during the manufacture of home appliances, electronics, metal furniture, garage doors, air conditioning equipment, furnaces, toys, novelties, automobiles, trucks, busses, aircraft and many other products," Acme said. "New applications are increasing throughout industry."

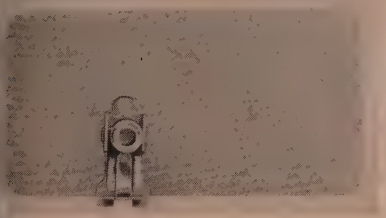


Tube Bending Tools Meet Close Tolerance Needs

Tube bending wiper dies and flexible mandrels which are adaptable to any standard brand of tube bending machine are being made by Leonard Precision Products Co., 9200 Bolsa Ave., Santa Ana, Calif.

They are designed especially to meet close tolerance, and extreme forming requirements of tubes of minimum wall thickness, according to Leonard.

The company stocks the tools for the most popular tube O.D. and wall thickness sizes, and all bend ratios down to ½ to 1. Smaller ratio dies and mandrels can be specially ordered.



New Clip Aids In Blind Assembly

A new clip nut series for one-side-only access on a wide range of panel thicknesses is being introduced by Shur-Lok Corp., Anaheim, Calif.

The SL88 series Clip-Nut is a snap-in "U" type nut plate, offering installation savings over plate or clinch nuts by eliminating riveting and setting operations and needing only one hole.

As the Shur-Lok Clip Nut is opened, the nut rises vertically and the clip "legs" stay parallel. The fastener is easily slipped over the panel-edges; the extrusion on the clip then snaps smoothly into the hole in the panel and the spring holds the clip firmly in place. The panel to be fastened is positioned and the screw inserted.

The new Shur-Lok series may be used wherever blind assembly is required on panel edges, and is helpful in the body of a panel if small holes can be made.

"An example of airframe application is fastening floor panels to structure; and applications in electronics are cabinet assemblies, boxes, boards and panels," said a company spokesman.

ace

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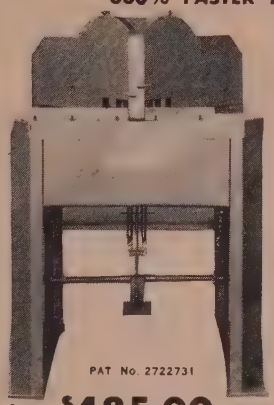

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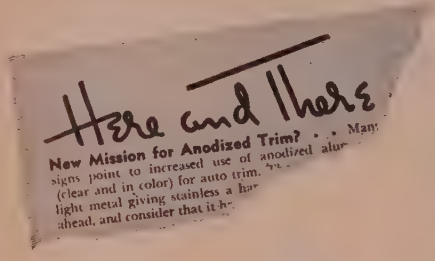
THE ANSWER to this question is of vital concern to every industrial advertiser, for it determines whether his message is getting through to the reader; whether he is getting maximum mileage out of his advertising dollar. Without an attentive audience, the advertiser's message goes unseen, unheeded.

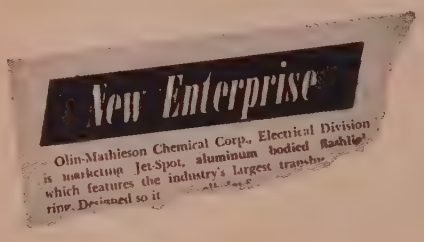
The editorial departments of **MODERN METALS,** as well as the feature articles in this issue, are well calculated to capture and keep the reader's attention.


Here and There

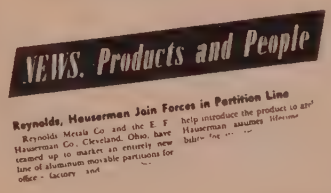
New Mission for Anodized Trim? . . . Many signs point to increased use of anodized alu- (clear and in color) for auto trim. ... light metal giving stainless a ha- ahead, and consider that it h-

Useful Data

Over 100 buffing and polishing compounds are described in Bulletin Co-103 of the Hanson-Van Winkle Munning Co., Matawan, N. J., manufacturer of a complete line of finishing equipment and supplies. ... page, two-color bulletin has a full-line ... coloring, and ... detail

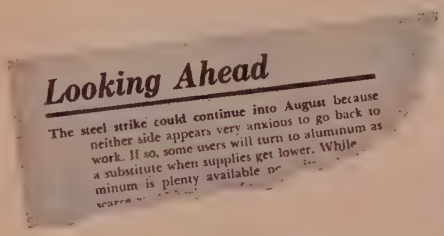

New Enterprise

Olin-Mathieson Chemical Corp., Electrical Division is marketing Jet-Spot, aluminum bodied flashlight which features the industry's largest transpar- ring. Designed so it ...


NEWS, Products and People

Reynolds, Hauserman Join Forces in Partition Line

Reynolds Metals Co. and the E. F. Hauserman Co., Cleveland, Ohio, have teamed up to market an entirely new line of aluminum movable partitions for office - factory ... help introduce the product to arc- ... Hauserman assumes lifetime ... battle-ing ...


Looking Ahead

The steel strike could continue into August because neither side appears very anxious to go back to work. If so, some users will turn to aluminum as a substitute when supplies get lower. While ... minum is plenty available ... scarce ...

HERE & THERE: Notes and comments on significant developments on the light metals scene. Often in a light vein, but factual, provocative.

USEFUL DATA: New brochures, booklets, etc. on new equipment, processes, materials, services of direct interest to light metals users.

NEW ENTERPRISE: Succinct news briefs covering new and significant product and process developments concerning light metals.

NEWS, PRODUCTS, PEOPLE: No puffs; strictly news of value and interest to readers. New products, equipment, materials, services, industry trends.

LOOKING AHEAD: Analysis of current developments, what they mean to light metals users. Keeps readers a step ahead of trends.

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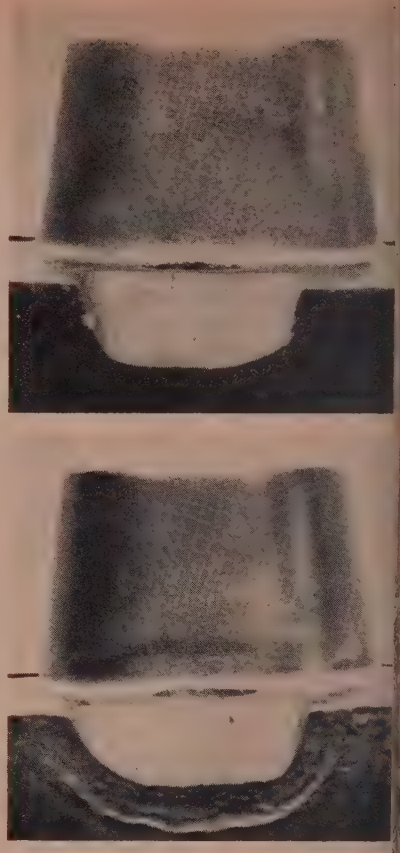

Molybdenum Superior For Die Casting Cores

A joint research program sponsored by the Die Casting Research Foundation has developed a new die casting core material which shows great promise in the casting of higher temperature metals such as aluminum, magnesium and brass. Consisting of a new molybdenum alloy, the material is said to be superior to die steel in resistance to heat checking or crazing, the most common cause of die failures.

The photos above compare the cores of ejector inserts after making 5000 brass castings. The core at top is of standard die steel; the other is of unalloyed molybdenum.

The new die casting core material was developed at Battelle Memorial Institute with the cooperation of Climax Molybdenum Corp. of Michigan, Universal-Cyclops Steel Co., and several members of the Die Casting Research Foundation.

About 1953, DCRF commissioned Battelle investigation to improve the service life of die casting dies. The properties of hundreds of materials were screened, and more than one hundred were selected for laboratory testing. Materials tested included hot work and stainless steels, chromium, nickel and cobalt base materials, cermets, carbides and molybdenum. Only molybdenum

played substantial superiority in re-
ing heat checking.
With one-half the thermal expansion
l four times the thermal conductivity
die steel, moly would be expected to
el in resistance to heat checking. Its
rdness, though very low at room tem-
rature, is at least twice that of stand-
l steel at 1500°F, and this can be
rther increased by alloying and im-
oved working.
Production tests by DCRF members
small and medium sized cores and
erts substantiated this prediction, in-
cating a very substantial increase in
sistance to heat checking compared
standard steel cores.
Available molybdenum alloys were ex-
mely brittle in the transverse direc-
n, resulting in gross cracking in the
rection of working. Elongation might
ry from 2 to 20% in the same piece.
w room temperature mechanical
operties, availability, and cost were
o deterrents in the early stages of
velopment.
However, higher purity materials fur-
shed by Climax Molybdenum and sub-
ntial improvements in working tech-
ques by Universal-Cyclops, principal
bricator of moly, resulted in greatly
proved properties and a reduction of
nsverse cracking.
Several DCRF members tested these
proved materials as cores in dies pro-
cing zinc, aluminum and magnesium
stings. They proved superior to earlier
oly alloy samples and to steel with
gard to heat check resistance. Hard-
ss, though improved by added work-
g, is still lower than desired (under 300
HN).
Reports on the 70 test cores in pro-
ction dies casting aluminum indicate
at 68% were substantially better than
e previous material, only 18% were
favorable, and 14% were still in test.
dvantages reported for moly cores in-
uded decreased downtime for polish-
g, longer life, and lower scrap from
ars on the casting surface.
Disadvantages included lack of me-
anical strength and ductility, low hard-
ss and abrasion resistance, sensitivity
thermal shock at lower temperatures,
nd high price.
Low hardness and room temperature
rength and availability in larger sizes
ave retarded the use of moly in die
locks. Furthermore, attempts to use
oly in die casting brass have been less
couraging due to premature pitting
nd gross cracking.
However, DCRF members have re-
orted a long list of successful applica-
ons of moly in cores and small die
mponents. Familiarity with its use has
rought out design and other features
o be avoided and enabled the more
ccurate selection of suitable applica-
ons of this new core material.

WHEN YOU'RE IN THE MAGIC CIRCLE YOU GET FASTER SERVICE FROM

SHEET ALUMINUM CORPORATION

56

If you're in the magic 500 mile circle around Jackson, Michigan, you can save time . . . save money on any aluminum sheet or coil—regardless of order size. Our complete, modern facilities, which include a new 4-High Rolling Mill, mean faster service, better service for you.

We custom roll aluminum to any thickness from .006" to .102" in coil and sheet . . . widths from 3/8" to 48". Temper and alloy will be to your exact specifications in a wide range of alloys including 1100, 3003, 5005, 5050, 5052 and 5357. Specified characteristics will be maintained throughout the rolling operation, with perfect uniformity in every shipment.

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JACKSON 90, MICHIGAN

A SUBSIDIARY OF MUELLER BRASS CO.

High Strength Epoxy Bonding Agents Also Seal, Fill

A new group of high strength epoxy bonding agents for bonding aluminum to aluminum or to other materials has been developed by Chemical Development Corp., Danvers, Mass. Cepox 400 series adhesives are also used for sealing and filling gaps.

"These thermosetting adhesives produce an extremely tough, water-insoluable bond that resists most acids, alkalies and other chemicals," the manufacturer said. "They have high impact, tensile shear, and compressive strength and will not dry out, crack or deteriorate with age. The Cepox adhesives, moreover, will not shrink since they are made of 100% solids with no solvent or diluent present."

Cepox 401 produces a tough, rigid bond and requires no heat or pressure for curing. Cepox 402 produces a strong, flexible bond with high peel strength. Like Cepox 401 it cures at room temperature. Both have a guaranteed storage life of one year under normal factory conditions.

The product is packed in pint, quart, gallon and 5-gallon containers. Each package has the exact amount of hardening agent and complete instructions.

Precision Saw With Air Clamps Makes Clean Cuts..Reduces Waste & Machining

FOR

Stainless
Aluminum
Magnesium
Copper
Glass

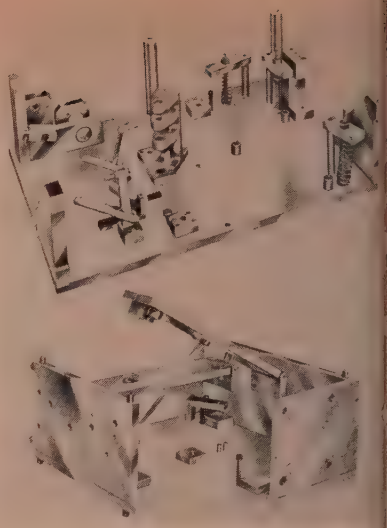
Rough edges left from shearing and inaccurate saws pile up needless machining bills . . . plus the cost of wasted metal. With this new Ty-Sa-Man 144-BD Saw, adjustable air clamps hold metal down while the saw travels down the machined transverse rail, delivering cuts with smooth edges to amazing tolerances. Cut parallel strips . . . handle difficult jig fixture work with this self-contained saw which has its own integral cooling system and tank. Among its features are a calibrated guide fence, infinite variable speed from zero to twenty FPM, push-button control and 15 HP motor.

Ty-Sa-Man
SINCE 1885

Write for FREE BROCHURE

TY-SA-MAN Machine Co., Inc.

1000 White Ave., Knoxville, Tenn.



New Tooling Plate Unveiled by Reynolds

No. 33 wrought aluminum tooling plate, claimed to have higher mechanical properties, consistent with stability than any other nonferrous material, has been brought out by Reynolds Metals Co.

Simultaneously announced by the Reynolds Aluminum Supply Co., Los Angeles, was No. 33-HC Reycote, the same as No. 33 Regular except that it has a hard anodic coating to provide greater wear and corrosion resistance for certain uses such as the fixtures shown above. Both tooling plate materials are to be sold nationally through Reynolds Aluminum Supply warehouses, Reynolds Metals' distributors, and machinist supply houses.

Reynolds No. 33 Regular is for applications in which three-dimensional machining is involved or where the surface is contoured, such as stretch dies or molds for rubber. Reynolds No. 33-HC with anodic coating is for drill jigs, mill fixtures, stripper plates, pressure pads, guide rails, and other applications which can be fabricated without machining the coated surface. A wide range of stock sizes makes this possible.

Either type can be machined to extremely low tolerances at speeds up to 6000 fpm, Reynolds reports. Their 100% dimensional stability, freedom from porosity, and light weight eliminate most of the shortcomings of other tooling materials, according to the company. Rapid and easy machinability is said to reduce labor as much as 60%.

Parallelism is within 0.005 inch in any direction with a surface finish of 32 micro-inches. Stresses are relieved 100% by stretching. Welding is fast and easy with high fracture and tensile yield values.

No. 33-HC Reycote also has a file hard

surface, rated between 60 and 70 on the Rockwell C scale. This .003-inch coating provides a wearing and corrosion resistant surface which is said to be superior to case hardened metals, yet is readily drilled, tapped, sawed, lapped or ground to plus or minus .0002-inch. Its cost is lower than that of precision-machined steels.

Precision-machined stocks in packaged form are now available from west coast warehouses in thicknesses from ¼ to 2 inches and widths from 1 through 24 inches. Standard length is 24 inches. Also available are sizes up to 60 inches wide and 144 inches long, in thicknesses from ¼ to 6 inches.

New Firm Enters Home Building Products Field

The home building products industry continues to attract aluminum people. Newest major entry in the field is DEK Industries, Inc., with facilities in Los Angeles, Downingtown, Pa., and Cleveland. The new formation is headed by R. Carter Dye, formerly director of national accounts, Olin Aluminum, and marketing manager, automotive division of Reynolds Metals Co. in Detroit. He is DEK Industries' president and treasurer.

Subsidiaries of the $1,200,000 corporation, DEK Industries, Inc. of California, DEK Industries, Inc. of Pennsylvania and DEK Industries, Inc. of Ohio, will manufacture and distribute aluminum siding, awnings, carports, shutters, wall tile and screen enclosures, Dye said. The Cleveland facility will serve mainly as a distribution center.

Dye, Fred H. Edgar, executive vice president, and Walter E. Kemmerer, vice president for sales, are also directors of DEK's five-member board.

Edgar has held executive posts in sales, research and manufacturing with Olin, Reynolds and the Aluminum Co. of America.

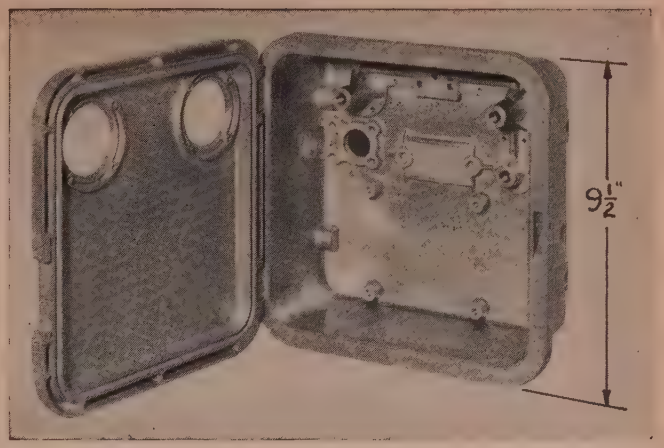
Kemmerer was formerly Olin's Cleveland district manager and prior to that post served in sales and marketing capacities with Reynolds Metals.

Other board members are Joseph Walker, Jr., a partner of Joseph Walker & Sons, investment brokers, and Thomas Parsons, a member of the law firm of Parker, Duryee, Benjamin, Zunino & Malone.

Construction on all DEK facilities has been completed, Dye reported. Current production plans call for 400,000 pounds per month for each plant. Ultimate capacity is expected to exceed 1,000,000 pounds per month for each plant.

He added that the corporation has based its initial marketing planning on the potential for aluminum building products in the new home construction and remodeling fields.

WHY ALUMINUM DIE CASTINGS?



Pressure controller cases, which must carry pressure in certain areas and be dust tight overall can be made in two or more component parts—each part is an integral piece.

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DIE CASTING COMPANY
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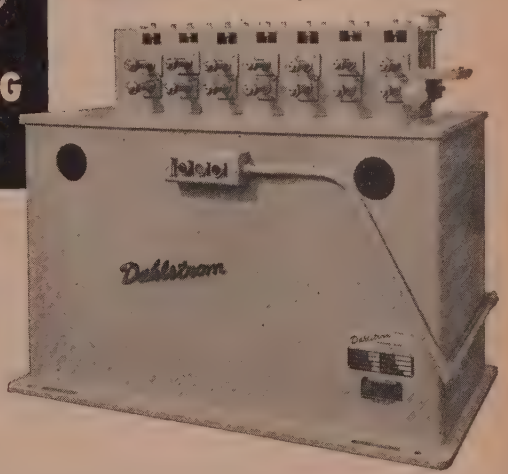
ANOTHER Dahlstrom ROLL FORMING MACHINE

Rugged Construction for Long Life
MODEL 150 — Open Front Type



Designed for economical and long dependable operation to complement your present Roll-forming or production facilities. Low Cost — Long Service.

Spur gear design. All-welded construction. Spindles mounted on anti-friction bearings —hardened and ground. Roll diameter range 2½" to 3¼". Horizontal c-c distance 5". Available either front or outboard type. Write for bulletin.

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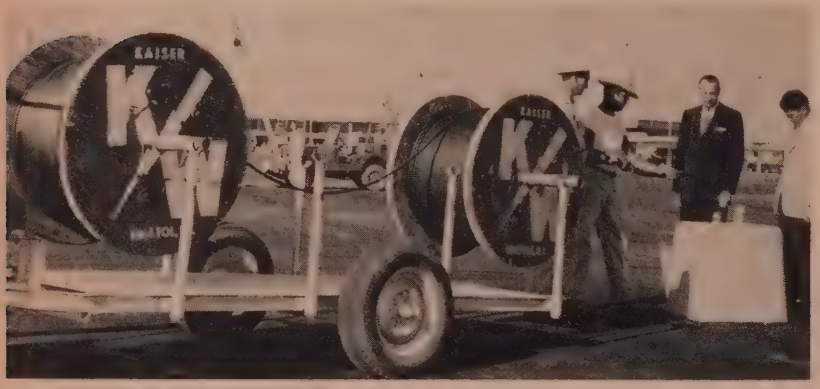
4231 W. Belmont Ave., Chicago 41, Ill., Phone: SPring 7-3670
Roll Forming Machines, Flying Cut-Off Presses, Coil Reels, Coil Lifts, Roll Straighteners, Press Feed Lines, Decoiling and Shearing Lines.

Automatic Saw Cuts Parts for Complete Window

An automatic electric mitering saw, product of the Wendel Mfg. Co., 312 Goucher St., Johnstown, Pa., makes possible the automatic cutting to size of a complete window, including inserts, without adjustments for various lengths.

An innovation called the Automatic Flip Gage allows for various length differences in a window to be compensated for automatically.

The Wendel Automatic cuts two 45 degree mitres simultaneously in a complete automatic cycle. It features a concealed unit of all welded steel construction that employs only one motor and a novel spiral gear, eliminating all belts and pulleys. It has an automatic cut and return mounted on frictionless roller bearings which carry the blades and motor as a single unit. It is also equipped with hold down clamps and blade spray lubrication.



Airport Has Huge Aluminum Lighting System

Miles of aluminum cable and hundreds of aluminum overhead lighting fixtures and standards forming the terminal area lighting system at Miami International Airport are a prime example of the light metal's growing importance in electrical construction.

Over 400 aluminum standards and 550 luminaires interconnected by nearly 23 miles of aluminum 3 KV direct burial cable, light the grounds surrounding the terminal building. The cable, a product of Kaiser Aluminum's Bristol, R. I., electrical conductor plant, is insulated and jacketed to comply with Federal Aviation Agency (formerly CAA) requirements. Cable is No. 2 size, 19 strand single conductor, non-shielded, butyl insulated and neoprene jacketed. The system supplies power for lighting traffic areas, a 6000-car parking lot, access roads, approaches, ramps and overpasses covering a total of 80 acres making it the second biggest single street lighting project in Florida's history.

Astor Electric Co., Miami Beach, the electrical contractor for the exterior lighting phase of the terminal construction, installed the aluminum cable in ducts beneath paved areas, and by direct burial elsewhere. In curbed areas the cable was buried directly next to the curb in fine sand which was covered with removable concrete sections before the trenches were filled. In open areas, the cable was installed in fine sand in 30-inch deep trenches.

The cable is run parallel throughout with one side grounded. Ground connections can be switched to the other line without expensive cable replacement costs should it become necessary.

Four-hundred watt constant wattage ballasts are connected between the "hot" and grounded cables at each pole base. The ballasts have stranded copper primary leads. One lead is run into an aluminum sleeve, splicing the continuing run of the "hot" cable. The other lead is run into an aluminum sleeve, splicing the continuing run of the grounded side. In addition, a No. 6 stranded copper lead runs from the grounded side splice to the ground stud and ground rod at each pole base.

For Astor Electric the wiring job was a first experience with this type of aluminum cable. As a result of the success with the airport project, the firm has selected Kaiser Aluminum direct burial cable for another big job in Miami.

Plan Mexico's First Aluminum Plant

Plans are being drawn up for Mexico's first aluminum production plant, according to the Mexico City newspaper, *Excelsior*. German, U. S. and Mexican capital is behind the project.

Intercontinental, S.A., of Mexico City, is handling the financial details. The firm's principal partners are Gonsalo Lavin, Adolfo Riveroll, and Bruno Poliai, one of Mexico's leading industrialists. The Krupp and Siemens interests of Germany and Allen & Co., financial underwriters and securities dealers in New York, are also contributing funds.

The newspaper report said that the $15 million plant will be built in the state of Veracrus not far from the Temazcal power plant which is operated by the Federal Power Commission. The plant will supply aluminum ingots. No information was given as to when construction will begin.

Argonne Lab Will Extrude Nuclear Metals

Sutton Engineering Co. has announced receipt of orders for two new hydraulic extrusion presses, one of which calls for unique press design.

Argonne National Laboratory, Lemont, Ill., has purchased a 600-ton Sutton hydraulic extrusion press for the extrusion of nuclear materials. Unique press design permits the working area to be completely shielded for operation in an inert atmosphere.

Being built for Saramar Aluminum Co., Youngstown, Ohio, is a 1250/1500-ton horizontal hydraulic extrusion press for their expanded program of extruding aluminum sections for the building industry. The new unit is expected to increase Saramar's extrusion output by 40%.

Both presses will be manufactured at Sutton's Bellefonte, Pa. plant for delivery later this year.

Men-on-the-move

James M. Hughes has joined Mallory-Sharon Metals Corp., Niles, Ohio, as general sales manager of titanium sales. He comes from Republic Rubber Div. of Lee Rubber and Tire Corp., where he was assistant general sales manager. He also spent 12 years with Goodyear Tire and Rubber.

Al Thurman has been named president of The Lombard Mfg. Co. and vice president of Lombard Corp. with headquarters in Youngstown, Ohio. After receiving degrees in mechanical and electrical engineering from Oklahoma State University he acquired, through various positions, wide experience in all phases of both the steel and nonferrous metalworking industries.

Chase Brass & Copper, subsidiary of Kennecott Copper Corp., Waterbury, Conn., has announced the appointment of **Ralph E. Herzler, Jr.,** to the position of product manager — aluminum. A metallurgical engineering graduate of the University of Illinois, Herzler joined the Chase sales organization in 1958 after service with Alcoa and Reynolds Metals Co.

Appointment of **L. C. Laderer** as executive vice president for Wells Aluminum Corp., North Liberty, Ind., has been announced. He had been vice president and director of sales. Laderer, who is presently serving on the aluminum Extruders' Council board of directors, joined Wells in 1953.

Alabama Metallurgical Corp., Selma, Ala., has announced the appointment of **Jerry B. Comer** as manager of employee and public relations. **Judson Hawthorne** has been named technical superintendent. Both have been with Calumet & Hecla's Wolverine Tube Division at Decatur, Ala., for 10 years. Newly appointed sales manager is **Kurt S. Sealander,** who had been chief metallurgist for Howard Foundry Co. and Hills-McCanna Co., in Chicago and the Magnesium Division of Alcoa. Alabama Metallurgical Corp. is 70% owned by Calumet & Hecla, Inc., and 30% by Brooks & Perkins, Inc., Detroit. Magnesium production is scheduled to begin at Alabama Metallurgical's new plant in Selma in September.

Financial Briefs

Gains for Revere Copper & Brass

A good second quarter is expected by Revere Copper & Brass, Inc. First quarter sales were $59,319,787, up 43.9% over the $41,217,949 reported for the first quarter of '58. Net income was $2,491,375 or 94 cents a share on 2,638,306 shares outstanding, as compared to $1,211,562 or 46 cents a common share on 2,618,306 shares outstanding in the first quarter of '58.

Revere executives say that Ormet Corp. facilities are operating at capacity and producing over 1 million pounds of primary aluminum a day. On Revere's 34% portion of this production, the company realized a small profit in the first quarter.

Bridgeport Brass Business Spurts

An intensive cost reduction program combined with a sharp sales recovery was held responsible by A. R. Zender, president of Bridgeport Brass Co., for the fact that his company's first quarter '59 net income ($2,154,638) was nearly four times first quarter '58 net of $564,617.

First quarter '59 earnings after preferred dividends were equal to $1.35 a share on 1,508,060 common shares, against per share earnings of 30 cents on 1,503,610 common shares outstanding at the end of the first quarter in 1958.

Sales for the three months were $43,034,351, well above the $29,320,919 for the first three months of '58.

Because much of the sales increase should be counted as forward buying, a precaution against possible industry strikes, "it is not practical to assume that our business will maintain itself at its present levels," Zender added.

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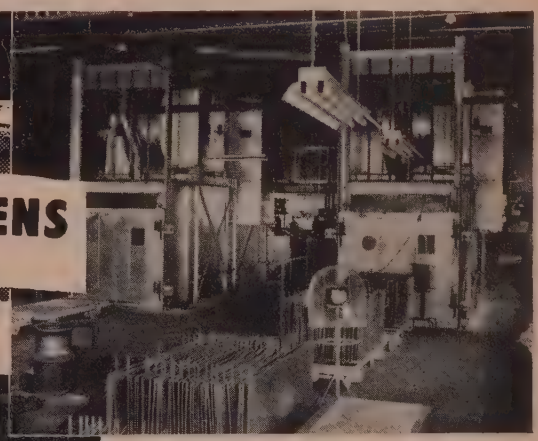

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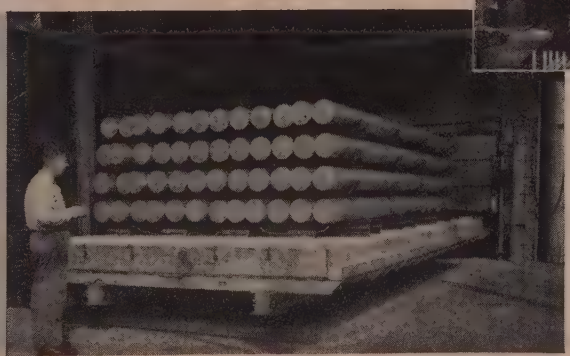

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And here's a market—the light metals industry—that's not only specific, but also growing fast. The industry is summarized below, showing the 25,339 plants by industry category and by region. Every one of these plants processes and/or uses aluminum, magnesium, or titanium in the manufacture of end products.

CENTRAL STATES

	East-N. Central	West-N. Central	East-S. Central	Total
BUILDING INDUSTRY	1759	768	281	2808
CONSUMER DUR. GOODS	728	175	73	976
CONTAINERS & PKG.	198	50	12	260
ELECTRICAL INDUSTRY	678	114	43	835
MACH. & EQUIP. (Non-Elec)	1065	271	58	1394
SCIENTIFIC & TECH. INST.	323	54	13	390
TRANS. & PARTS	708	142	53	903
ORDNANCE & MILITARY	22	5	9	36
LIGHT METALS PROC.	2663	461	184	3308
MISCELLANEOUS INDUS.	363	80	31	474
Area Totals:	8507	2120	757	**11,384**

WESTERN STATES

	Mountain	Pacific	West-S. Central	Total
BUILDING INDUSTRY	163	621	481	1265
CONSUMER DUR. GOODS	18	148	61	227
CONTAINERS & PKG.	5	63	30	98
ELECTRICAL INDUSTRY	14	183	46	243
MACH. & EQUIP. (Non-Elec)	21	211	107	339
SCIENTIFIC & TECH. INST.	14	74	32	120
TRANS. & PARTS	40	310	101	451
ORDNANCE & MILITARY	7	30	5	42
LIGHT METALS PROC.	91	642	289	1022
MISCELLANEOUS INDUS.	9	43	29	81
Area Totals:	382	2325	1181	**3888**

EASTERN STATES

	North-east	Middle Atlantic	South Atlantic	Total
BUILDING INDUSTRY	436	1681	760	2877
CONSUMER DUR. GOODS	155	459	164	778
CONTAINERS & PKG.	48	148	44	240
ELECTRICAL INDUSTRY	247	589	105	941
MACH. & EQUIP. (Non-Elec)	204	599	98	901
SCIENTIFIC & TECH. INST.	113	280	51	444
TRANS. & PARTS	123	300	143	566
ORDNANCE & MILITARY	15	22	17	54
LIGHT METALS PROC.	656	1604	424	2684
MISCELLANEOUS INDUS.	127	403	52	582
Area Totals:	2124	6085	1858	**10,067**

25,339 PLANTS

A market survey . . .

. . by Modern Metals defined and charted this industry, and Modern Metals' circulation list is based on this survey. Here, then, the most accurate and comprehensive light metals industry list in existence. Only Modern Metals has this dynamic list, made up entirely of manufacturing plants, and only Modern Metals is read in every one of these plants. That's why Modern Metals is by far the most efficient advertising medium for companies that supply materials, equipment and services to light metals processors and users.

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Looking Ahead

Two industry-wide unions — the United Steelworkers, and the Aluminum Workers Union — will begin bargaining with the four major aluminum producers late this month. Their three-year contracts with the producers run out July 31st, and industry observers do not agree on the prospects of a strike. Union negotiators make it clear that their demands will be high, and at least one industry leader — Alcoa's I. W. Wilson — has indicated that the companies will resist wage demands as vigorously as big steel has.

United Steelworkers has prepared an ambitious package asking for a substantial wage hike, cost-of-living adjustments, shorter work schedules, higher weekend premium pay, better unemployment benefits, improved insurance and pensions, longer vacations, more paid holidays, revised grievance procedures, etc. — pretty much the same demands the steel makers are currently wrestling with. Aluminum Workers Union will submit similar demands. More than 50,000 aluminum workers — most of them employed by Alcoa, Reynolds, Kaiser and Ormet — are involved. Unlike the steel industry, aluminum firms will bargain with the unions individually.

Outcome of the steel industry negotiations is expected to set the pattern for aluminum, as in past years, but Alcoa's Wilson pointed out that "our economic position, as compared with steel, is more pressing against a wage increase. That, presumably, should be in our favor to hold the wage rate down." He was probably referring to the fact that aluminum profits in the first quarter were down compared with the first three months of '58, while steel makers' earnings rocketed to two to five times the year-earlier levels. The unions, on the other hand, will most likely stress the fact that aluminum workers make from 18 to 38 cents less than the average steel employee. So the stage is set for some rugged bargaining.

Workers at Harvey Aluminum emphatically rejected the bid by the United Steelworkers and other unions to act as bargaining agents at the company's two major plants. The vote in NLRB elections went 2-to-1 against the unions in Harvey's fabrication plant at Torrance, Calif., and 2½-to-1 against at the new primary smelter at The Dalles, Ore. A Harvey spokesman said that the company's working conditions match those of other producers, and that Harvey's wage rates "are among the highest in the industry."

Anaconda Aluminum has already signed a pact with the Aluminum Workers Trades Council, which represents 11 different locals at Anaconda's Columbia Falls (Mont.) smelter. Anaconda agreed to a wage hike averaging 8.23 cents an hour, plus fringe benefits; will also accept an across-the-board increase next November if wage rates in other aluminum plants in the Northwest are raised as a result of the negotiations of the big producers. Anaconda's contract is effective until November 1, 1960.

Hedge buying in anticipation of a strike accounts, in part, for booming aluminum sales. But the big hypo is rising demand from aluminum's major markets — building industry, autos, appliances, etc. — that are feeling the full effect of the recovery. To the surprise of practically everybody, near-shortage conditions have returned to the aluminum industry. The sudden spurt in demand has touched off a rush to get idle capacity into production.

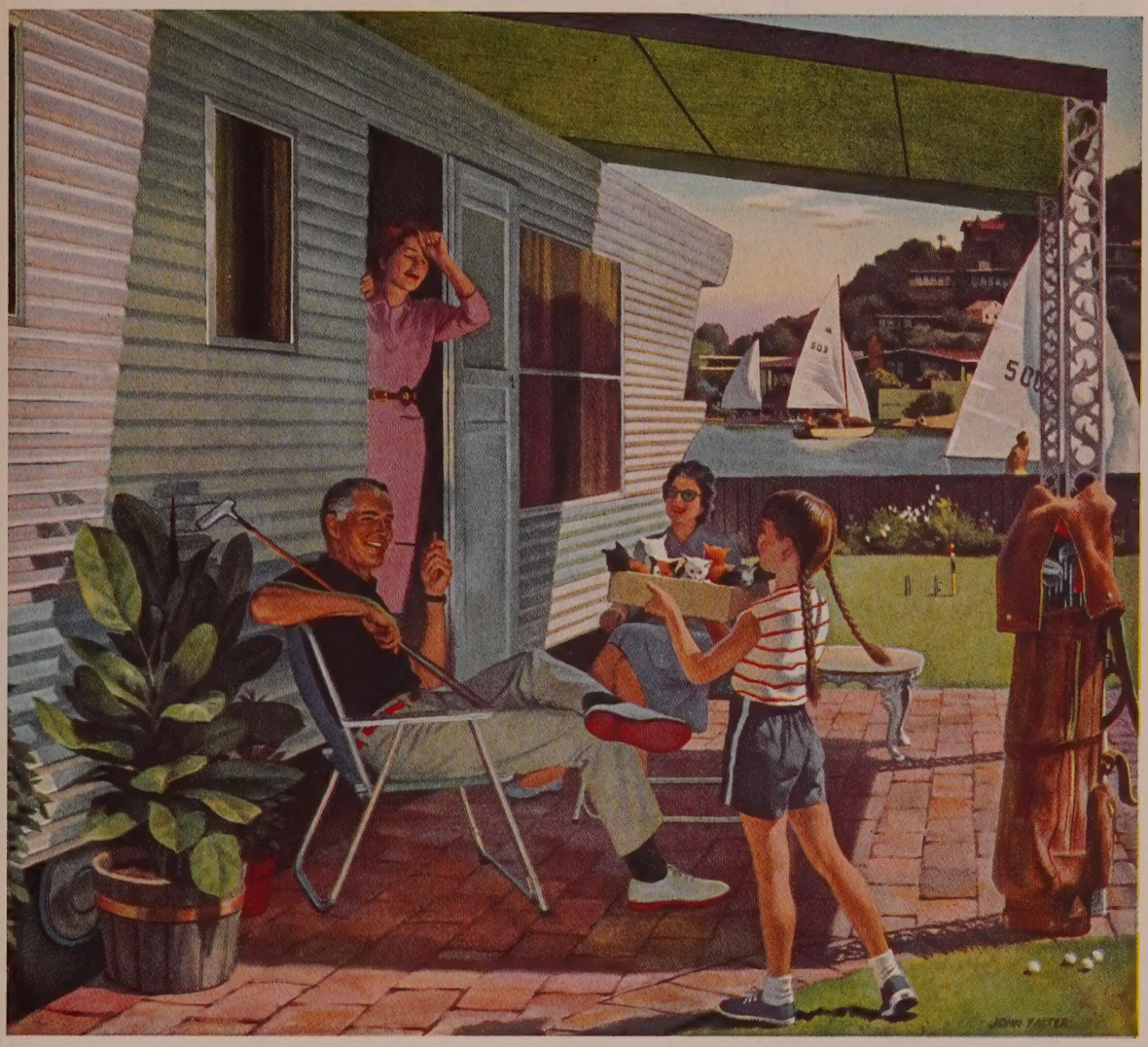
The industry is currently operating at around 90% of primary smelting capacity. Early this month, Kaiser Aluminum boosted output to 86% of its total annual capacity of 609,500 tons. Reynolds Metals upped its production to 100% of capacity of 601,000 tons. (This does not include Reynolds' new smelter which is nearing completion at Massena, N. Y.) Alcoa has boosted output to 82% of capacity. Anaconda Aluminum will reactivate enough pots at its Columbia Falls smelter to push production to 88% of capacity. Ormet is reported to be running at close to full capacity, and a Harvey Aluminum spokesman said that the company is selling every pound of aluminum it can produce.

It all adds up to record-breaking production — nearly 90% of present installed capacity totaling a little over 2,302,000 tons annually. Last July, the industry was limping along at 70% of the slightly more than 2 million tons of capacity installed at that time. The aluminum revival looks all the more remarkable when you realize that "put right" shipments to the government stockpile have dwindled to a mere trickle this year compared to the large tonnages shipped to the government in 1958.

All aluminum producers are switching to the "delivered price" basis, following Kaiser Aluminum's announcement early this month that effective July 1, "all shipments will be on the basis of delivered price at the customer's plant, or at that point where the customer or his agent takes possession of the metal. . . ." Historically, aluminum has been sold F.O.B. plant, with full freight allowed to the customer's destination as designated. Both Reynolds and Alcoa later announced that they would adopt the same system, effective July 1.

Russia has a serious aluminum shortage on its hands, and it will probably continue for several years. A Soviet government leader reported at the Communist party Congress earlier this year that the original Seven Year Plan goal of tripling aluminum production by 1956 would be inadequate. He advised that the target be raised. This comes as something of a surprise in view of the fuss about the "threat" of Russian aluminum about a year ago.

— The Editors



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With the trend towards ever-larger, more luxurious units, it's going to take more and more aluminum to satisfy the demand for homes on wheels, now being produced at the rate of 150,000 a year. But more aluminum for mobile homes means less aluminum for other U.S. needs . . . needs that will probably double by 1965. Fortunately—in nearby Canada, Aluminium Limited has harnessed water power to create electricity to make aluminum. As in the past, an important part of this will help meet the United States' increasing needs.

Aluminium Limited sells no consumer products in the United States. Instead, it supplies primary aluminum to U.S. fabricators who have no smelting facilities of their own. It also contributes to the development of key industrial techniques—such as the welding that helps make possible the modern mobile homes of today.

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